JUNE 1995

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EDITORIAL

HELLO FOLKS AND WELCOME TO THE JUNE ISSUE OF SPECTRUM UK, WHAT A BUSY TIME WE HAVE HAD OVER THE PAST TWO MONTHS, THINGS ARE GOING AT AN INCREDIBLE PACE, MEMBERSHIP NUMBERS ARE RISING ALL THE WHILE, AND AN INTERESTING THING THAT IS STARTING TO HAPPEN IS THAT SOME OF THE NEW MEMBERS WHO HAVE JOINED US DON'T EVEN OWN A SPECCY, THEY USE DIFFERENT MACHINES AND EMULATORS, THEIR INTERESTS LIE IN THE GOOD OLD SPECTRUM SOFTWARE, JOE BY THE WAY HAS WRITTEN A VERY INTERESTING PIECE ON EMULATORS IN THIS ISSUE OF THE MAG.

NOW LET ME THANK THE MEMBERS WHO HAVE RESPONDED TO OUR PLEA IN THE LAST ISSUE FOR ARTICLES FOR THE MAGAZINE, THEY ARE EXCELLENT AND I AM SURE THAT THE OTHER MEMBERS WILL FIND THEM AS GOOD A READ AS WE DID, SO THANK YOU ALL FOR TAKING THE TIME AND TROUBLE TO GET INVOLVED, JUST ONE LAST WORD ON THE SUBJECT ... LET'S HAVE LOTS MORE PLEASE, THANK YOU.

WE ARE RATHER CONCERNED ABOUT TWO COMPANIES WHO ADVERTISE WITH US I.E:- SOFT OPTIONS AND OMNIDALE, WE ARE AT THIS MOMENT TRYING TO SORT THINGS OUT CONCERNING THEM, IN THE CASE OF SOFT OPTIONS SOME MEMBERS HAVE WRITTEN IN ASKING IF THEY HAVE FOLDED... WE DON'T KNOW AS YET BUT WILL KEEP YOU INFORMED, IN THE MEANTIME WE ADVISE YOU NOT TO SEND ANY MORE ORDERS TO THEM UNTIL THINGS ARE CLEARED UP, IN THE CASE OF OMNIDALE THIS SEEMS TO BE A MATTER OF MEMBERS WAITING FAR TOO LONG TO GET THEIR SPECCYS BACK FROM REPAIR, AGAIN UNTIL WE CAN SORT THINGS OUT, DON'T SEND ANYTHING FOR REPAIR, WE WILL NOT CARRY EITHER COMPANIES ADVERTS UNTIL THINGS ARE CLEARED UP.

A LETTER CAME THE OTHER DAY FROM OUR GOOD FRIEND THOMAS EBERLE, I WON'T COMMENT ON IT TOO MUCH HERE BECAUSE WE HAVE INCLUDED IT IN THIS ISSUE, I MUST SAY THOUGH THAT WE ARE VERY DISAPPOINTED FOR HIM.

YOU WILL NOTICE IN THIS ISSUE THAT THERE IS ONLY A SMALL SECTION ON 'ASK BILL' THE REASON FOR THIS IS THAT WE WANTED TO TAKE SOME OF THE WORK LOAD FROM ARNOLD WHO DOES A STERLING JOB WITH HIS 'BACK IN TIME' ARTICLES, WE HAD A MEMBER WRITE IN OFFERING TO TAKE OVER THE 'ASK BILL' SECTION, WE WERE DELIGHTED BUT AS OF YET WE HAVEN'T RECEIVED AN ARTICLE. IF THERE IS ANYONE OUT THERE WHO IS WILLING TO TAKE ON THE JOB THEN PLEASE WRITE IN AS SOON AS POSSIBLE, THANK YOU.

EDITORIAL

SADLY YOU WILL ALSO NOTICE THAT THERE IS NO DILLANS DEN OR ZINNERMANS ZEST IN THIS ISSUE, THE REASON FOR THIS IS THAT DILLAN WHO INCIDENTLY WRITES BOTH ARTICLES, HAS A MOUNTAIN OF PERSONAL PROBLEMS TO SORT OUT, SO HE JUST HASN'T HAD THE TIME TO WRITE ANYTHING, DILLAN HAS BEEN WITH US FROM DAY ONE AND OVER THAT TIME HE HAS BECOME A VERY GOOD FRIEND INDEED AND WE HOPE THAT HIS LUCK SOON STARTS TO CHANGE FOR THE BETTER, AND WE WISH HIM WELL AND THANK HIM FOR ALL THE WORK HE HAS DONE FOR SPEC UK, AND HOPEFULLY WHEN HE GETS THINGS SORTED THEN ONCE AGAIN HE MIGHT WRITE SOME MORE GREAT ARTICLES, THANKS MATE.

BEFORE I FORGET I REALLY MUST APOLOGISE FOR SOME OF THE PRINT QUALITY IN THE LAST ISSUE, AS YOU ALL KNOW OLD BESSIE DECIDED TO KICK THE BUCKET AT EXACTLY THE WRONG TIME SO WE HAD TO FINISH THE MAG ON THIS NEW MACHINE HENCE SOME BAD PRINT, HOPEFULLY WITH FINGERS CROSSED AND EVERYTHING ELSE CROSSABLE WE SHOULD BE ALRIGHT NOW.

WELL FOLKS THAT JUST ABOUT WRAPS IT FOR THIS ISSUE, WE HOPE THAT YOU ENJOY THE MAG, AND WE WANT TO THANK EVERY MEMBER WHO HAS CONTRIBUTED TO THE MAKING OF IT.

WE WILL SEE YOU ALL IN THE AUGUST ISSUE, DON'T FORGET IF YOU WANT TO WRITE AN ARTICLE THEN BY ALL MEANS DO SO AND SEND IT IN, SO UNTIL NEXT TIME.....

BYE NOW

ROY AND JULIE

INTERFACE

Roy and Julie have kindly let me include this column on a regular basis. They're so sweet and nice, and wonderful, and generous, and charming, and, well, lets get on shall we.

I have covered a few DIY projects in the past, and i hope to continue these. Also i shall be looking at some unusual off the shelf hardware, past and present. There will also be "INTERFACE OF THE MONTH". These are items which can still be purchased new, or newish, and represents good value for money.

Lets get on with this issues main article. A joystick interface for any 48k Speccy.

How many times have you found yourself in a situation where you have loaded a game into your 48k Spectrum, to find that you have the wrong joystick interface...? Or wish to connect a printer or disk drive, but have no through port.

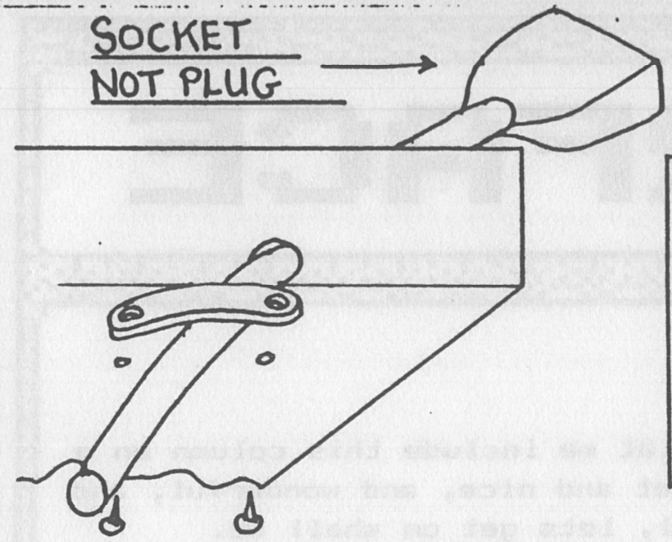
Well, it just so happens that you can have a joystick interface, leaving the Expansion port free for all those add-ons for less than one pound...?

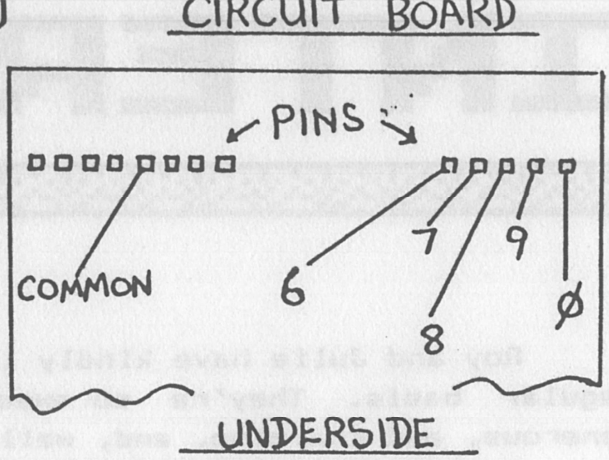
Impossible...! but it's true, one 9 pin D-type socket and six wire connections...?

Watch what happens when you use your joystick when connected to a Sinclair Interface 2, (I.F 2 from now on) before loading a game. You should see a series of numbers, normally 6,7,8,9, and 0 if you press fire. Each movement of the joystick is the same as pressing the appropriate key on the keyboard.So by making a series of connections between the circuit board and the keyboard membrain, a joystick socket can be connected to achieve the same results.

It really is that simple...? although some care has to be taken when removing the keyboard and circuit board, prior to soldering.

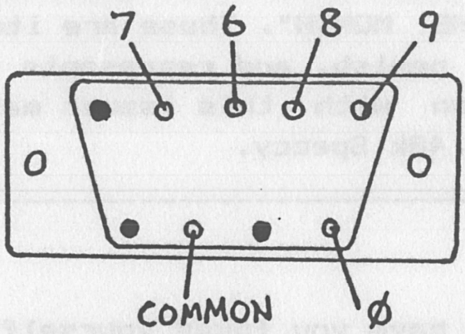
I recently made this modification to my 48k+, and found it to be faultless. Because the 48+ is physically larger than the rubber keyboard version, you may have to use a lead shown in the diagram.





RUBBER KEYBOARD VERSION

JOYSTICK SOCKET LOOKING FROM THE FRONT



After removing the crosshead screws, a decission has to be made weather you want to remove the keyboard from the circuit board, or try to keep both parts together while soldering...? Trying to install the membrain back into its socket can be very tricky...? However, what you can do to make things easier is to place a piece of foam between the two parts, and use masking tape to keep them secure.

The six solder connections are made to the underside of the circuit board. Following the diagram, make the connections to the pins on the membrain sockets, using suitable lengths of wire. It is probably wise to lay a piece of insulation tape between the wires and circuit board to stop chafing when finished.

A suitable hole must be made into the lower casing for the joystick socket. An ideal position would be at the opposite end from the reset switch. Once the socket is connected, it and the circuit board can be lowered into the case.(Remembering to remove the foam if fitted...?) The joystick socket is normally retained by two small screws (Remember to fit these before closing the lid...?) When finished, all that remains is to test it...?

Any joystick which works with Kempston or I.F 2, will work with this circuit, but unfortunately the 128 joysticks do not.

One of the real benifits from this modification comes when playing in two player mode. Normally this means one player using a joystick while the other operates the keyboard. By connecting up your Kempston, and having your inbuilt I.F 2, both players can sit back and be on equal terms. This gives a whole new lease of life to games like "The Way of the Exploding Fist" and "Bruce Lee".

INTERFACE OF THE MONTH

GREENWELD ELECTRONIC COMPONENTS are currently offering a new Amstrad joypad for 3.95. Now i know its for an Amstrad, but i pluged it into my Interface 2, and it worked perfectly. Although only one, of the two fire buttons worked, this could easily be remedied.

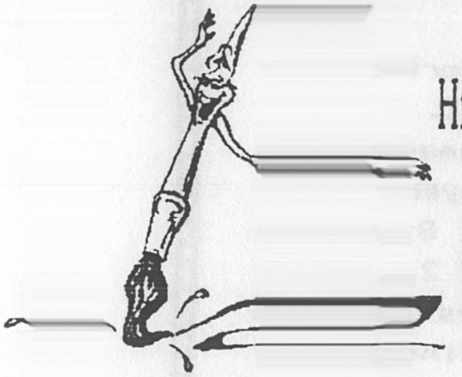
Item No. Z5435
Address. 27, PARK ROAD
SOUTHAMPTON
SO15 3UQ

I have recently built a Voice Controller for the Speccy, and although its a little crude, it has been great fun using it. I will be including details soon. For those who can not wait, i am prepared to build one or two for members. So if you would like details then send a SAE to the address below.

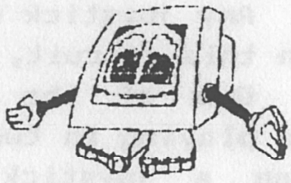
Finally has anyone got a copy of RTL's Speechwriter, or software for a FOX programable joystick interface for sale.

Well, thats it for this month. See you in the next issue.

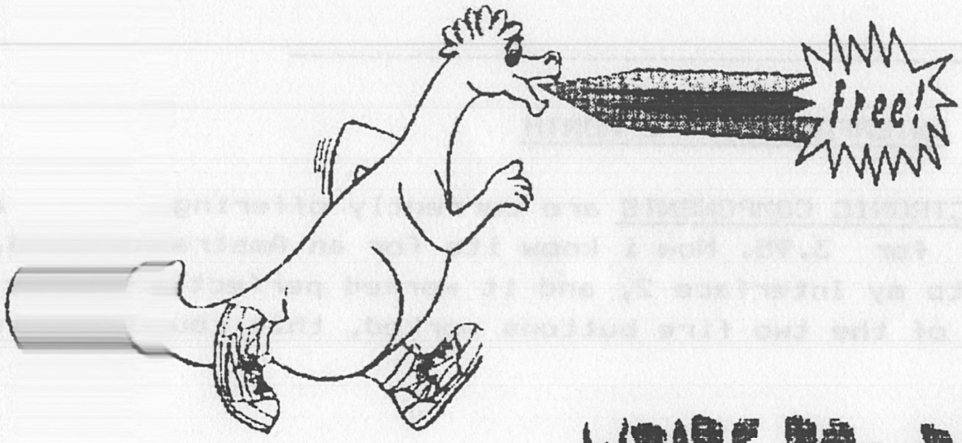
Kevin Gurd
27, The Millpond
Holbury
Southampton
Hants
SO45 2QN



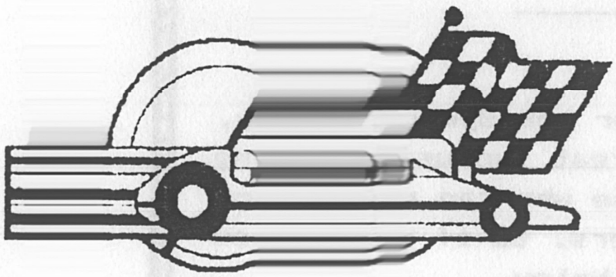
Hi SPECTRUM UK.....

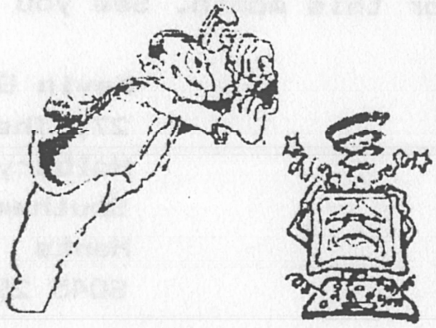


HELLO ! FROM PENPAL UK .....



WRITE TO : PENPAL UK
348 Quinton Lower Falinge,
Rochdale, Lancs OL12 6RE





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READ ALL ABOUT IT.

This issue we are looking at three very different assembly language tutor books. We begin with the book that has possibly introduced more people to machine code programming than any other. It is certainly the best known tutor by far.

SPECTRUM MACHINE LANGUAGE FOR THE ABSOLUTE BEGINNER.

Edited by William Tang.
Published by Melbourne House ISBN 0 86161 110 1 the copyright was registered to Beam Software in 1982.

The concept behind this book was clearly to teach the younger Spectrum user, as a cartoon elf representing the CPU is used to illustrate the text at various points. The first section gives a brief overview of machine language and the way in which a CPU operates.

The next two sections are primarily concerned with computer arithmetic which is related to the elf counting on his fingers and toes. Hexadecimal is introduced right from the start and is used throughout the rest of the book. This I feel was a mistake, as I believe being forced to use hex to learn the basic concepts has deterred many users from pursuing their initial interest. If decimal had been used with the hex equivalent also shown then I am sure many more people would have taken up assembly language.

The rest of the book takes the reader step by step through all the major concepts, culminating in the writing of a 'Frogger' game. The appendices are extremely useful as they include all of the following:- Spectrum key input table, screen display map, character set table, Decimal/Hex converter, flag operations summary, Z80 instructions by op-code, and Z80 instructions by mnemonics. Basic listings are also given within the main text for both a M/C editor and Hex M/C monitor.

It may seem that I do not greatly rate this book but such an impression would be both misleading and wrong. It is a very good introduction to assembly language especially for the age group at which it was aimed. It is also an invaluable aid for any learner who finds a particular concept difficult to grasp as the simplistic approach can often succeed in imparting the required knowledge, where more adult orientated books fail to do so. There are few people who find every aspect of assembly language easy to grasp, therefore most learners could find this book of great use at some point in their learning curve. A true collectors item well worth owning.

SPECTRUM & SPECTRUM+ ASSEMBLY LANGUAGE COURSE.

by Martin E. Thompson.
Published by Glentop ISBN 0 907792 44 8 Copyright 1985.

This formed part of the Glentop Dr. Watson computer series, and was issued in a video style case complete with program cassette. The cassette contained an assembler and binary/hex/BCD tutor, both obviously very useful aids to learning. The book consists of 10 well written and easily understood chapters. The subject is covered in reasonable depth with good explanations and examples. The inclusion of test exercises for each chapter is a useful feature, as it allows you to ensure you fully understand the

subject matter covered before proceeding to the next chapter.

Unlike the previous book hex is not introduced until chapter four which covers M/C arithmetic. A very good point I feel is that where it will aid clarity decimal is still used in subsequent chapters. It is therefore a less painful process to gain familiarity with both hex and binary. When used with the tape tutor, appendix 5 should soon make you competent in the new number bases.

The book has 5 appendices entitled The Z80 instruction set, Effects of instructions on flags, Effects of compares on the overflow, sign and carry flags, The built in routines, and Binary, Binary-coded and hexadecimal notations. The closing section contains possible solutions to the test exercises.

This is a very good basic tutorial to assembly language and should provide a good general understanding of the subject. When completed you should be ready for more advanced tutorials. The inclusion of the software is a bonus enabling entry of the examples without purchasing a separate assembler, which could have slightly different conventions to those used in the text. If you are considering taking up M/C programming then this could be a book well worth seeking out.

Our last book this issue is one of my non Spectrum specific volumes but is still interesting in many ways.

Z80 ASSEMBLY LANGUAGE PROGRAMMING FOR STUDENTS.

by Roger Hutty.

Published by Macmillan ISBN 0 333 32295 9 in 1983.

The author was at the time of publishing the principle lecturer in computing at Leicester Polytechnic so has a deep understanding of both his subject, and teaching methods. He states that the book has been written in such a way as to be used both in the classroom and for self study. It follows a similar system to that used by Martin Thompson in that it contains exercises the answers to which are given at the rear of the book. The subject is clearly explained and the whole course is well laid out. The main difference being that no details relevant to the Spectrum's architecture are included. Therefore it is necessary for the student to research such details as the display file for themselves.

If you are one of those people, who find that seeking out the details needed to apply what you have learned increases your understanding of the subject, then you could do much worse than using this tutorial. If you are interested in teaching programming languages this book gives useful instruction on the correct formula to use.

Well that's it for this issue, so happy reading/learning until next time when it will be the turn of Basic tutorials.

ASK

BILL

AFTER RECEIVING A LETTER FROM ARNOLD YATES THAT HE IN RETURN HAD RECEIVED FROM THOMAS EBERLE SUGGESTING SOME ALTERNATIVE SOLUTIONS TO SOME PAST ASK BILL QUESTIONS WE HAVE DECIDED TO PRINT THEM HERE IN AN UPDATE.

APRIL ISSUE, ASK BILL, question from jean:

FIRST, YES IT IS POSSIBLE TO FIT THE SPECTRUM WITH A TAPE-COUNTER, IN FACT ALL OF THE THINGS THAT ARE NEEDED TO FIT IT ARE BUILT IN. YOU JUST HAVE TO BUY THE COUNTER AND FIT IT IN THE SPECTRUM AT THE RIGHT POSITION, ALSO YOU HAVE TO MAKE A HOLE IN THE SPECTRUM CASE, IF YOU WANT, ONE OF MY MEMBERS HAS DONE THIS AND CAN GIVE YOU FURTHER INSTRUCTIONS, JUST WRITE IN TO CO/SPECTRUM UK AND ROY WILL PASS YOUR LETTER ON

APRIL ISSUE, ASK BILL, question from albert:

IT IS NOT SO MUCH TO DO TO REBUILD A 16K TO A 48K, BUT IN FACT IT IS MORE THAN ONLY USING THE CHIPS OF THE 48K. BUT YOU DON'T NEED A NEW ULA, YOU ONLY NEED THE RAMS AND A SMALL CHANGE AT THE CIRCUIT. IF YOU WANT I WILL ASK MY REPAIR MAN FOR MORE INSTRUCTIONS FOR YOU, AS HE HAS BUILT 6 SPECTRUMS FROM 16K TO 48K.

JANUARY ISSUE, ASK BILL, question from peter:

THERE IS A WAY TO TRANSFER 3" DISC TO 3.5" BUY THE CABLE FROM CHRISTOPHER BOX, OFFERED ALSO IN SPECTRUM UK. CONNECT THE +D DRIVE TO THE B: OF THE +3. THEN USE SOME SPECIAL SOFTWARE THAT IS AVAILABLE FROM EITHER PRISM PD OR ALCHEMIST PD, THIS WILL ENABLE YOU TO COPY 3" to 3.5". THIS FORMAT IS READABLE ON THE +D.

THANKS TO THOMAS AND ARNOLD FOR THIS UPDATE.

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B A C K T O B A S I C S NO.5

by Ken Beer.

READ & DATA Commands

Up to now we have been entering data at the keyboard in response to an INPUT command. Another way to get data into a program is to store it in a DATA command within the program itself, and to READ the items of data from these DATA commands. Note. *DATA* is obtained by pressing 'D' key when in the extended mode E.

READ is similarly obtained by pressing key 'A' when in the extended mode. (Reminder-Extended mode=press CAPS SHIFT and SYMBOL SHIFT together).

Each time the computer comes to a READ command, it takes an item of data from the data list and assigns it to the variable specified in the READ command. Try this simple program:

```
10 READ a
20 PRINT a
30 DATA 10
```

Not very exciting !

but where READ & DATA statements come into their own is when there is a large number of data items to be entered. In each case READ is assigned a letter if the Data items are numeric. However, the Data can be in string form, in which case the a$ to z$ sign has to be used for READ items and as usual when using string characters each item must be enclosed within inverted commas. Also, each separate item must be followed by separation commas both for Read & DATA statements.

The following is an example of numerical characters:

```
10 READ   a, b, c
20 PRINT  a
30 PRINT  b
40 PRINT  c
50 DATA  10, 20, 30
```

There must always be the same number of data items as READ items. If there is less, then the computer will display the Error message:

E Out of DATA followed by the line number on which the error occurred. Here is an example of the string form

```
10 READ   a$, b$, c$
20 PRINT  a$
30 PRINT  b$
40 PRINT  c$
50 DATA  "TOM", "DICK", "HARRY"
```

You can of course mix numeric and string providing you obey the rules above e.g.

```
10 READ   a$,b,c,d$
20 PRINT  a$
30 PRINT  b
40 PRINT  c
50 PRINT  d$
```

```
60 DATA "FRED" , 3 , 9, "TED"
```

SPECTRUM SOUND

Now I am going to talk about the sounds that the Spectrum can produce and how to program it.

The Spectrum has an inbuilt loudspeaker through which it emits the required sound in response to the program fed to it. The *BEEP* command controls all sound programs. This takes the following form:

```
BEEP, duration,  pitch
```

where pitch is the pitch of the sound and duration is the approximate length of time in seconds that the sound is emitted. Note. 'BEEP" is obtained by selecting the extended mode E and Symbol Shift and key marked 'Z'.

As a sampler try these:

```
10 BEEP  .1, 5
20 PAUSE  15
30 BEEP  .1, 10
40 PAUSE  15
50 BEEP  .1, 15
60 PAUSE 15
70 BEEP  .1, 20
80 PAUSE  15
90 GOTO   10
```

```
10 FOR n=1 TO 20
20 BEEP  .1, n
30 NEXT   n
```

N.B DOn't forget that *'FOR'* and *'TO'* are both Keywords.

(To break out press SPACE bar).

We can relate pitch values to musical notes as follows:

pitch value	0	2	4	5	7	9	11	12
note	Middle C	D	E	F	G	A	B	C

If you are musically inclined you should be able to relate duration to note duration i.e.

Assuming a basic time duration of say 0.5 second,
Perhaps a Minim could represent 2 time units = 1.0 sec.

Note Symbol	Minim	Crochet	Quaver	Semi-quaver
Time Units	2	1	0.5	0.25
Duration (secs.)	1.0	0.5	0.25	0.125

And finally, a musical scale using the READ & DATA commands we learnt about above:

```
10  FOR K = 1 TO 8
20  READ   P
30  PRINT  P
40  BEEP   0.5,P
50  NEXT   K
60  DATA   0, 2, 4, 5, 7, 9, 11, 12
```

I wish you luck in making your music !
and I hope to see you next time .

USING THE 128K SECOND SCREEN FROM BASIC

By Miles Kinloch

This article refers to the grey +2 and Sinclair black 128K.

The +2 manual makes the somewhat misleading claim that the 128K's alternative screen in RAM 7 cannot be used directly from BASIC. This article, however, seeks to demonstrate how this can in fact be achieved, provided certain precautions are observed.

For the sake of beginners, let's start by explaining a little about how the extra memory is configured. The Z80 processor can only handle 64K at any given time, i.e. addresses 0-65535, so this means not all the extra RAM can be available at once. It has therefore been arranged in 16K blocks, known as 'banks' or 'pages'. When one of these banks is required, it is switched or 'paged in' to occupy addresses 49152-65535 - in other words, it is swapped for the RAM that was there before. Since paging can only take place within this top 16K of the memory map, only one bank can ever be present at any single time.

The RAM pages are assigned numbers 0-7, with page 0 being the one normally *in situ* when running a program, and thus forming part of the main memory. RAM pages 2 and 5 have something of a dual role, for while constituting sections of the main memory (16384-32767 and 32768-49151 respectively), they can also be paged into the top 16K, if desired - though why one might wish to do so, is another matter! (Has anyone found a use for this?) Anyway, that leaves us with pages 1,3,4,6 and part of page 7 at our disposal: the 128 BASIC Editor uses areas of RAM 7 itself for various purposes, so not all of that page is actually free.

The method for accessing the memory banks involves POKEing a system variable 'BANKM' at 23388, but first, we must do something very important - enter CLEAR 49151 (or lower) - otherwise the stack will be paged out, causing a crash.

It's not just RAM, incidentally, that's selected in this way: the 128K machines also have an extra 16K ROM. However, there's not much point in paging this shadow ROM from BASIC - on the contrary, great care must be taken to avoid this happening, or a crash will result. The value POKEd into BANKM must therefore reflect BOTH the ROM and the RAM required, and is calculated by adding the RAM page number to 16 - the latter being the ROM component. (For those interested in the technical aspects, bits 0-2 of the byte govern the RAM page; bit 3, the screen; and bit 4, the ROM.) So, for example, to page in RAM 1, you would POKE 23388,17; to page RAM 7, POKE 23388,23 and so on.

Probably the most effective application of all this, as I say, is in controlling the second screen. This resides at address 49152 in RAM 7, and can be displayed in place of the normal screen by again POKEing BANKM. First, you must decide on your ROM/RAM combination needs, then add 8 to this value if you want the new screen too. Note, by the way, that the screen can be shown quite independently of the current RAM paging status - contrary to popular belief, it is NOT necessary for RAM 7 to be paged first. On the other hand, RAM 7 does need to be present

before you can alter its contents, so let's take a look now at how a SCREEN$ might be loaded into this area:-

```
10 CLEAR 49151: REM Move stack out of top 16K
20 POKE 23388,23: REM 16 (ROM) +7 (RAM)
30 LOAD "screen" CODE 49152
40 POKE 23388,16: REM 16 (ROM) +0 (RAM)
```

If you prefer, you can substitute 23 with 31 (i.e. 23+8) in line 20: this would then actually display the second screen area (initially black) while the screen is loaded into it. Line 40 is not strictly necessary, in fact, as the 128K operating system will restore the default paging automatically afterwards, but I included it anyway for the sake of clarity.

To show the screen, we would use the following:-

```
10 POKE 23388,24: REM 16 (ROM) +0 (RAM) +8 (Screen)
20 PAUSE 0
```

This displays it in conjunction with the normal ROM/RAM combination used by BASIC. When you press a key and return to the 128K Editor, the standard screen will then be restored.

Here is a short program that flips alternately between normal and second screens at the press of a key:-

```
10 REM INSTALL
20 CLEAR 49151
30 POKE 23388,23: REM Page RAM 7
40 LOAD "screen2" CODE 49152: REM second screen
50 LOAD "screen1" SCREEN$: REM main screen
60 REM FLIP
70 POKE 23388,16: REM Show main screen
80 PAUSE 0
90 POKE 23388,24: REM Show second screen
100 PAUSE 0
110 GO TO 70
```

So far, we have been assuming the use of 128 BASIC, but there is, in fact, a way to use the extra memory from 48K, known in the trade as USR 0 mode. This term comes from the fact that if you enter 48K by typing USR 0 (as opposed to the opening menu option or the SPECTRUM command), then although you will be in 48 BASIC, the 128K paging mechanism will still be accessible. Now, however, POKEing 23388 won't make any difference - you must use the paging port directly, in order to access the extra RAM. This is [OUT 32765,n], with 'n' being the same value you would have POKEd into 23388 in 128 BASIC. Apart from this aspect, though, all the other comments apply equally to paging when in USR 0 mode, including the need to CLEAR 49151 (or less) beforehand. For machine code programmers, USR 0 mode confers certain advantages, as it frees the printer buffer memory for use, while still exploiting the full 128K RAM.

Finally, please note that care should be taken with the 128K's Ramdisk facilities when the second screen is in use: a Ramdisk file could well encroach upon the second screen area, resulting in corruption.

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GO FORTH.

Part 9.

To contimue our look at string handling we will consider an alternative method of filling a string. This involves halting the execution of the program to accept input from the keyboard. The two 'WORDS' that do this are 'QUERY' and 'EXPECT'. The most often used of these is 'EXPECT' which requires an address to be on the stack before it is used. The number of characters to be input must also be placed on the stack. Since the 'WORD' 'PAD' places the address of the pad on the stack we could enter PAD 20 EXPECT which would halt the program and wait for us to enter 20 characters from the keyboard. Less characters may be entered if input is ended with the Enter key.

'QUERY' acts in a similar way except that it expects upto 80 characters to be input, which it then stores in the Terminal Input Buffer. If combined with 'WORD' we can input upto 80 characters and split them into individual words. This is how it is done with explanations in brackets where necessary:-

```
0 VARIABLE WORDONE 8 ALLOT
0 VARIABLE WORDTWO 8 ALLOT
: INWORDS     (sets up variables and starts compilation of
definition)
WORDONE 10 32 FILL
wordtwo 10 32 FILL (reserves space for 10 characters a fills with
spaces)
CR .' ENTER YOUR TWO WORDS WITH A SPACE BETWEEN THEM THEN PRESS
ENTER'
QUERY
32 WORD HERE (accepts input with space as delimiter'
COUNT WORDONE SWAP CMOVE (finds 1st word and stores it)
32 WORD HERE
COUNT WORDTWO SWAP CMOVE (as above for 2nd word)
```

If we then use 'INWORDS' as below we can access and print the words to the screen.

```
INWORDS
WORDONE 10 TYPE
WORDTWO 10 TYPE
```

The number 10 simply sets the maximum number of letters in each word, which can be set in your prompt for input when using 'INWORDS'.

I think that is enough about string$ etc. for now so let's move on to branching and looping. The Forth procedures for decision making and branching are somewhat different to those of Spectrum basic. The first to consider is the 'IF' 'ELSE' 'THEN' configuration. We will use an example to demonstrate the way it is implemented and works.

```
:NEGPOS
DUP ABS .
0<
IF .' NUMBER IS NEGATIVE'
ELSE .' NUMBER IS POSITIVE'
THEN
;
```

To use this definition try placing different positive and negative numbers on the stack before using the 'WORD' .
eg 12 NEGPOS or -5 NEGPOS

Let's exam this definition in more detail;
DUP ABS this duplicates number on stack and prints its absolute value to the screen, leaving the number on the stack for the next instruction to evaluate.
0< in normal Forth convention a number must be on the stack for 'IF' to evaluate. in this case 'IF' the number is less than 0 the number is removed from the stack and replaced with a flag signifying 'true'. 'IF' greater than 0 the flag obviously represents 'false'. The number is still removed from the stack.
'IF' the decision is 'false' the instructions between the 'ELSE' and 'THEN' statements is executed. 'IF' 'true' the instructions between 'IF' and 'ELSE' are executed. The program will then continue after the from the 'THEN' statement.
The main thing to remember is that the 'condition' must be placed on the stack before 'IF' is used.

The 'WORDS' 'DO' and 'LOOP' perform a similar function to basics FOR a =1 TO 10 for example, with some important differences.
Consider this example:-

```
: NUMBERS
7 1
DO
I .
LOOP
;
```

Let's follow this through carefully. Our definition for 'NUMBERS' places 7 and 1 on the stack as the limits of the loop. 1 being the counter and 7 the upper limit. 'DO' removes these from the stack and places them on another internal stack called the Return Stack. 'I' fetches the counter for the loop and places it on the stack so that it can be printed to the screen. 'LOOP' adds 1 to the counter on the Return Stack (not the main stack) and compares the result to the limit. If it is less than the limit the loop continues from the 'DO' statement. The loop is terminated when the counter is equal to or greater than the limit as you would expect. If you enter this definition you will find it prints the numbers 1 to 6 to the screen not 1 to 7 as you may have expected. This is because in Forth the instructions between 'DO' and 'LOOP' are always implemented at least once, therefore 1 is always added to the counter by 'LOOP'. In our definition this means 1 will be printed before 'LOOP' is reached therefore in the first comparison of counter and limit the counter value will actually be 2. Think about this carefully and it should soon be clear.

The STEP instruction in basic is replaced in Forth by '+LOOP' which requires the value of the step to be on the stack when it is called. As expected the number may be either positive or negative to provide ascending and descending steps. We could rewrite our 'NUMBERS' definition to print every third number thus:-

```
:NUMBERS
12 0 DO
I .
3 +LOOP ;
```

'DO' 'LOOP' may be used to create a delay within in progam just as FOR-TO can in basic. 500 0 DO LOOP is the formula required.

Next we have 'BEGIN' 'WHILE' 'REPEAT' which allows the execution of instructions for as long as a given condition is true. It is difficult to give a simple example of this structure but I hope the following will make it clear:-

```
: NUMPRINT
10 9 8 7 6 5 4 0
BEGIN
0>
WHILE .
REPEAT ;
```

There is also the 'BEGIN' 'UNTIL' structure which is useful either to wait for a key to be pressed or to carry out instructions till a specific condition is met.

```
: NONZERO
10
BEGIN
1 -
DUP .
0>
UNTIL ;
```

'INKEY' places the ASCII code of a key on the stack or 255 if no key is pressed. To wait until a key is pressed we could define:-

```
: KEYPRESS
1000 0 DO LOOP
BEGIN
INKEY 255 <
UNTIL ;
```

The loop is included to provide time for you to release the key.

A very useful structure is provided by the 'CASE' procedure in Abersoft Forth which is not generally available in normal versions. 'CASE' allows for multiple choices within a loop to provide a facility similar to basics ON- GOSUB structure. Without 'CASE' many 'IF' 'THEN' statements would be needed. The example in the manual shows this quite clearly but I will repeat it here for clarity.

```
CASE
6 OF .' This is number 6' CR ENDOF
9 OF .' This is number 9' CR ENDOF
12 OF .' This is number 12' CR ENDOF
ENDCASE
```

This would print a number to the screen if the number TOS was either 6 or 9 or 12. Any other number would result in nothing printed.

Well I have run out of time for this issue so we will end there. Next time we will look at those 'WORDS' used in earlier definitions but not yet explained. We will also begin planning our simple Forth game. Until then have fun experimenting with this issues definitions.

****
*
* COLLECTOR'S JOURNAL
*
* WRITTEN BY.....THE COLLECTOR *
****
*

After reading in the April issue of Spectrum UK Roy and Julie's plea for member's articles I thought that I would write Collector's Journal, I am first and foremost an avid collector so I hope that this article will be of interest to all the collectors out there, right here we go.

My first computer was a 16k rubber keyed Spectrum that was given to me by a friend who had tired of it. With it came a handful of old games; albeit simple by today's standards but I found them fascinating to say the least. (One of these, Magic Meanies , is still a favourite).

I began adding a few more titles each month and started buying the monthly Spectrum magazines. These opened up the world of Spectrum to me. I discovered bigger and questionably better Spectrum models, especially the +2A and the +3. By this time my collection was growing fast and the collector's bug had bitten. I eagerly snatched up new titles as they were released and scoured the magazines for older titles I had missed.

Sadly when the last of the Spectrum magazines shut it's doors the supply of new Speccy titles dried up almost overnight. At this stage I had over 1,000 games.

It was a sad day for the Speccy when Your Sinclair ceased but it had hidden advantages for the hardened collector. Many shops slashed prices and games costing pounds could be got for a few pence. Unfortunately this was shortlived as shops sold out and did not replace stock. A few software houses like Zeppelin and Codemasters (of Dizzy fame) continued to sell directly to the public , but only while stocks lasted.

Nowadays collecting Speccy games has been relegated to car boot sales, market stalls and newspaper ads.

Bulk buys can sometimes produce surprising results -sometimes good but not always. One game 'Caterpillar' is my personal jinx - I have had four separate copies all faulty. (Working copies gladly accepted.) Duplicate games can always be sold on or swapped.

Knowing what to collect is often a problem but my collecting days began in the days of 'Crash', 'Your Sinclair' and 'Sinclair User' when there was a limitless flow of Speccy information. (Sadly my collection only dates back to 1989.) These old magazines are now a collector's bible for reference (and nostalgia). They themselves have become sought after items.

When the games total reached 2,000 I decided it was time to catalogue them - on a Spectrum +3 (what else). I also prepared a 'wanted list' all on the 'Mini Office Database'. The main reason was the size of the collection - no-ones memory is that good. I found about thirty duplicate games (which I advertised for sale). A few of my favourites I have more than one copy of 'Dizzy', 'Space Crusade' and 'Electro Bingo' spring to mind.

I still have a list of forty titles I would like, Not all are rare; I have just not come across them - YET. They fall into three categories. The earlier games like 'Fred' and 'Deus ex Machina'; some of the last games released were never widely circulated like 'Atomic Robokid' and 'Paperboy 2' and finally the specialised games like adventures and strategy (amongst my finds were original copies of 'Hampstead' and Bismarck').

So what do I do with all these games - hoard them like a miser's treasure ? Only partly true. Yes, they are boxed away, but only after I have transferred working copies onto +3 disk with a Multiface 3.

And the cost ? Like most I have a limited income and so have set myself a monthly spending limit. Yes, it is flexible, and Yes, I have been known to get carried away on occasion. More so, since I recently started up a collection of 8 bit machines - but that's another story.

I would like to thank Joe Blizard who gave me every encouragement in putting this article together. (It was difficult resisting turning it into a shopping list!).

BASIC OBSERVATIONS

By John McClean.

After reading Ken Beer's excellent Back to Basics articles and hearing of Spectrum UK's plea for contributions I thought I would respond by writing my own personal observations in the hope that it will be of help to other members.

Firstly, I would like to draw other "users" attention to the TRUE and INVERSE (INV) VIDEO keys (which are situated at the top left hand corner of keyboard.) (+2 ?). These keys have often mystified me in the past, so I decided to experiment with them and discovered that the functions they provide can be put to a good use by programmers.
For example :-

To make a REM statement within a "prog" more pronounced and easily found when LISTing, simply type line number, depress INV VIDEO key, depress REM key (standard E), then write REMinder or REMark, depress TRUE VIDEO key to return to standard printing, then ENTER.

Note:-
It is important to depress TRUE VIDEO key immediately after you have completed typing REM statement otherwise the INVERSE PRINTING mode will carry on into next line of "prog".
Another example of INVERSE printing applications would be when the "programmer" actually wishes to have a certain "phrase" or "statement" PRINTed inversely on the screen within a "prog" when it is RUN, without the usual bother of using INVERSE 1(on) command.

Example:-
To print the word "hello" INVERSEly on the screen, simply type line number, then depress PRINT key (standard P), select INVERTED commas ("), depress INV VIDEO key, print word (hello), depress TRUE VIDEO key, close INVERTED commas("), then ENTER.

This method of INVERSE PRINTING is easier, I find, to remember as the "programmer" is actually only turning this mode of PRINTing "on" and "off" again when required. An added bonus is the amount of LINE space that is occupied, which is considerably less than when using the more usual method of INVERSE 1 or 0 (on or off). In the case of the previous example no less than 1Ø spaces have been saved for further STATEMENTS or COMMANDS. Again, it is important to note that the TRUE VIDEO must be depressed immediately after the actual words, letters or digits the "programmer" wishes to be INVERSEly displayed so as to return to "standard" PRINTing once more.

BASIC OBSERVATIONS

By John McClean.

To move on to adding colour to your PRINTing let's first consider how this may be acheived.
Firstly, to obtain "solid" blocks of a particular colour normally, the "user" needs to either use the cursor right key (>) in "graphics" mode (GRAPH key) to get a "solid" block in conjunction with the PRINT INK 5 (etc) command to get the specifically required colour for that block, or the PAPER 5 (etc) command in conjunction with a "space" (SPC BAR) which results in the basic function of PRINTing the chosen colour in the required number of "spaces" which more or less amounts to the same thing.
I have also experimented with other ways to obtain colour and have discovered the following:-

Example

the above coloured blocks can be obtained by an alternative method; i.e using the EXTEND mode with digits (or numbers).

E.g

STEP 1 → PRINT LINE NUMBER → 1Ø (etc)
STEP 2 → TYPE "PRINT" (P key) → PRINT
STEP 3 → SELECT INV. commas (") → "
STEP 4 → Go into EXTEND mode → E
STEP 5 → SELECT COLOUR NUMBER → 5 (etc)
STEP 6 → DEPRESS "SPACE" BAR → EACH DEPRESSION FOR ONE MORE COLOURED SQUARE ?
STEP 7 → DEPRESS "EXTEND 7" → this turns "off" colour * (see note)
STEP 8 → SELECT INVERTED COMMAS (") → " (close commas)
STEP 9 → PUSH "ENTER" → TO ENTER LINE.

*NOTE:-

the exception to this rule is when digit (number) 9 is selected. Depressing "key" 9 results in white squares being printed with BRIGHTness turned "ON". To turn "off" colour mode the "user" must select "EXTEND" 8 in this particular instance. (Don't ask me why _____ I only work here ??). So care must be taken if this "colour mode" is employed when programming as "EXTEND 7" will not cancel colour mode !!
Also, one further point on this method of PRINTing colours, is the use of digit 8. Selecting number 8 (standard 8 key) results in a "blank" square being PRINTed, similar to using the more normal "SPACE" key (SPC BAR).
The use of digit 9 (9 key) has other applications within a "program" as it can be utilised to make PRINTed numbers, letters,words or phrases more pronounced and clearer and therefore easier to read from the "screen".

BASIC OBSERVATIONS

By John McClean.

E.G repeat STEPS 1 to 5 as in previous example and select number 9, now the "user" can PRINT any statement or numbers he/she wishes and these will be PRINTed on "screen" with BRIGHT white background. (remember (*) exception above to select "EXTEND 8" in this case to turn "off" colour mode!!) The colours available are just the normal INK/PAPER colours (0 → BLACK, 1 → BLUE, 2 → RED, etc) with the inclusion of BRIGHT white, as explained above.
As you will have probably noticed, once again, there is a "saving" in valuable LINE space as with previous descriptions using TRUE and INVERSE VIDEO keys.
Further experimentation showed that digits (numbers) and/or letters, words, etc, could be PRINTed in different colours by using an alternative to PRINT INK (5) etc, here follows the method.

EXAMPLE

STEP 1 ⇒ PRINT LINE NUMBER ⇒ 10 (etc)
STEP 2 ⇒ TYPE "PRINT"(P key) ⇒ PRINT
STEP 3 ⇒ SELECT SPEECH MARKS(") ⇒ "
STEP 4 ⇒ SELECT "EXTEND MODE" ⇒ E
STEP 5 ⇒ DEPRESS,either one of the following keys to obtain desired colour for PRINT.

	TRUE VIDEO key	= Magenta
	INV. VIDEO	= GREEN
	EDIT	= BLUE
	CAPS LOCK	= RED
(<)	CURSOR LEFT	= CYAN
(V)	CURSOR DOWN	= YELLOW

STEP 6 ⇒ DEPRESS desired numbers, letters, etc; to PRINT.
STEP 7 ⇒ After PRINTing; select speech marks once more ("close commas)
STEP 8 ⇒ DEPRESS "ENTER" to ENTER Line.

As yet, I haven't discovered a way to "turn off" any one of the particular desired "colours" which means that (in this PRINTing mode, anyway,) when each LINE is ENTERed that colour will carry on into next LISTed Line. (If any other Spectrum UK members come up with a method to acheive this, then please drop me a line !!)
Another interesting effect can be obtained simply by depressing key GRAPH (graphics key) in STEP 5 of above example. This utilises the FLASH mode without having to actually use command FLASH 1 (on);the only problem is, again, due to the fact that unless the "user" can discover a way to switch "off" the FLASH mode, this will continue on to the next line that is ENTERed for listing.

BASIC OBSERVATIONS

By John McClean.

You may wish to PRINT statements, numbers, letters, symbols etc; using the above method but require these to be PRINTed INVERSEly; this is acheived using the following method:-

EXAMPLE

Follow STEPS 1 to 5 as for coloured PRINTing above, then depress the INVerse VIDEO key, and continue to PRINT in INVERSE mode any statements, digits, etc, until completed as in STEP 6. Follow STEPS 7 and 8 when completed LINE is finished.

The programmer can, at any time during PRINTing alternate between PRINTing characters (letters etc) in TRUE VIDEO mode or INVERSE mode simply by depressing required key before commencing to PRINT. As a final point, before leaving this subject, the programmer can "combine" all above styles of PRINTing to acheive a wide range of possible PRINTed colours, E.G Magenta letters, etc; on a black background, Blue letters, etc; on a cyan background, etc; etc; _____ experimentation is the only way to discover all possible combinations of PRINTing styles and colours.

Well that's it for this first instalment of my own personal Basic Observations.

Next time I will show you another personal observation that might prove useful in writing "games" programs.

The Review Page.

This month, I was going to review the SpecDrum, but I got a letter (shock horror!) from a man who still was not sure about the differnt Speccys so I am going to give this the full treatment.

Oh yes. I lost the letter in my computer tray, sorry!

It started with the ZX80. The first real home computer that was cheap enough for the man in the street to buy!

Next was the ZX81. This was a upgraded ZX80 in a new case.(See Sinclair Review).

Now came the ZX Spectrum. An easy and cheep introduction to powerful home computering. They were right. This was done using a +2a and a Dot Matrix printer. A PC couldn't do any better with the same printer.

It came in two versions. The 16k and the 48k. They had rubber keys and the Sinclair one touch keyword system. They cost £125 and £175.

Then there came the 48k+. Basicly, this is a 48k Spectrum in a new case. A different keyboard was fitted. It went clack and the keys were flat.

The QL. No, this wasn't a Speccy, but a new Sinclair computer. It had better graphics, more memory and it also had a lovely old 48k+ style keyboard, and was fitted with two Microdrives. I have never seen one of these, so I can't say much about it apart from I want one!

Sinclair said it was time for a new Speccy. The 128k+ was born. A menu system was introduced, which I quite like. It makes the computer feel powerful. It had a 48k+ style keyboard and a heat sink on the side so you could tell the two apart.

Sinclairs' sales were falling fast, so Sir Clive sold out the arch rival, Alian Suger for 6 million pounds. Amstrad took the 128k+, upgraded it, put it in a new case, fitted a tape deck on the side and called it the +2. It had the same

'main system as the 128k+.

The next computer that Amstrad marketed from the Sinclair range was the +2a.

This again had the same menu system as the other two, but the Tape Loader was replaced with the LOADER option. This had the power to load from a disk based media. This was very useful. It rest of the option were the same.

The last ever Spectrum to come out was the +3. Basicly, this was a +2a, but with a 3" disk drive, not a tape deck.

This matched Amstrads CPC range, but i'm not sure what was the most sucsessful, the CPC's or the Speccys.

All the 128k Spectrum's had a RAM disc, which was one of the most useful systems on any of the Spectrums. This could be acessed with.....

SAVE!"filename" LOAD!"filename" CAT!

Or.....

SAVE"M:filename" LOAD"M:filename" CAT

See you next month!

Code Cruncher

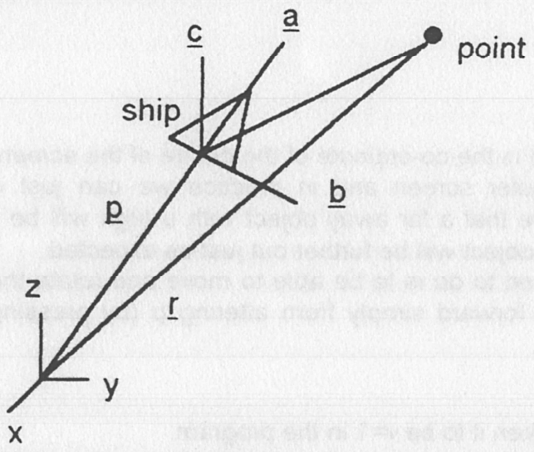
By JOHN BLACKBURN

Comments to:

Shannas Schoolhouse,
Clola,
Mintlaw,
Aberdeenshire AB42 8AE.

Greetings code cruncher cadets. This month, I would like to tell you about *Virtual Reality* or 3D graphics as I prefer to call it (*Virtual Reality* is a term which has been rather overused by advertising executives.)

The type of virtual reality I have in mind for the following program is the very simplest possible (thats all I know). I have also written it in BASIC (er, well pascal actually but you can convert it as shown below) which means it will be hopelessly slow (sorry). The alternative would be to write it in machine code (ugh!) but I for one would rather liquidise my head than try that (no,really). Excuse me, I seem to be developing a split personality (no you're not (yes I am) (?) (?(!))). I think I need to go and lie down (*sob*).



Imagine if you will a point in space with position vector r and a spaceship at position p. The orientation of the spaceship is given by three orthogonal unit vectors a, b, c with a along the axis of the spaceship. Our task is to print the point on the screen so that a stationary observer looking at the screen sees the same thing as the pilot of the spaceship would see. We need to resolve the ship to point vector r-p along a, b, and c.

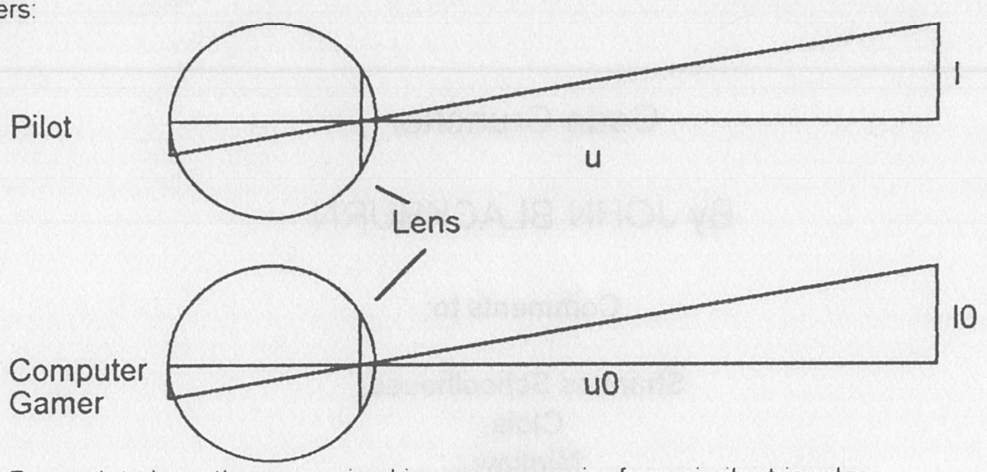
$$\mathbf{r}-\mathbf{p}=u\mathbf{a}+r\mathbf{b}+s\mathbf{c}$$

$$u=\mathbf{a}\bullet(\mathbf{r}-\mathbf{p})$$

$$r=\mathbf{b}\bullet(\mathbf{r}-\mathbf{p})$$

$$s=\mathbf{c}\bullet(\mathbf{r}-\mathbf{p})$$

u is simply the distance between the ship and the point. Now imagine the eyes of our two observers:



For each to have the same sized image we require from similar triangles.

u0/u=l0/l
l0=u0/u*l

l corresponds to either r or s in the above equations since the image is 2 dimensional on the retina of the observers. So finally:

$$x = x(c) + r\frac{u()}{u}$$

$$y = y(c) + s\frac{u()}{u}$$

Where (x(c),y(c)) is the co-ordinate of the centre of the screen. u0 is the distance of the observer from the computer screen and in practice we can just choose this to be some reasonable value. Observe that a far away object with u high will be towards the centre of the screen whereas a nearer object will be further out just as expected.

What we now need to do is to be able to move and rotate the spaceship to fly around the point. We can move forward simply from altering p (by pressing space in the program). Then:

$$\mathbf{p}' = \mathbf{p} + v\mathbf{a}$$

If v is the speed. I have taken it to be v=1 in the program.

The ship can rotate about its axis or nose up and nose down. (about a or b to be precise). Rotating two vectors about each other through an angle theta requires a little trigonometry and I'll leave you to work it out from the program. It involves a suitable linear combination of the rotating vectors to get the new values of each. Note the old value of one vector needs to be stored temporarily.

Neither BASIC nor Pascal can handle vector algebra directly so the above equations need to be written out as scalar equations in x,y,z co-ordinates. As you can see this involves quite a lot of equations.

Of course flying around one point is pretty boring. The following program allows you to fly around a shape made of dots. You can choose between a plane, dome, cone or sine wave thing each of which is made of 100 dots.

To make things especially interesting, this program is written in Pascal! This is so I don't have to convert it but I also thing you might find it interesting to see a Pascal program and compare it with BASIC.

The variable declarations at the start are just there to add colour, you can ignore them for the spectrum.

Stuff like a:=5 is the same as LET a=5. Pascal does not have line numbers but each line ends in a semicolon (;). The spacing between lines is of course not allowed in basic. In fact spacing is irrelevant in pascal, two 'lines' can be in the same line of the screen as long as they are separated by a ;. In basic this would correspond to :. If '-' represents a command then the two languages compare as follows:

Pascal	BASIC
-;	10 -
-;	20 -
-;-;-;-;	30 -:-:-:-

FOR loops are of the form

FOR a:=1 to 5 do	FOR a=1 to 5
begin	
-	-
-	-
-	-
end	next a

Pascal also has repeat until loops which can be simulated by BASIC if then goto:

repeat	10 -
-	-
-	-
a:=a+1;	let a=a+1
until a=7;	if a<10 then goto 10

Pascal has formal procedures which can be called from the main program be writing their names. In BASIC, use GOSUB RETURN.

procedure results	10 REM results
begin	
-	-
-	-
-	-
end;	return
BEGIN	rem Main program
results;	gosub 10
-	-
-	-
END.	stop

Pascals single line ifs are very similar to those of basic

if a=1 then a:=a-1	if a=1 then let a=a-1

Pascal also has multi-line ifs

```
if a=1 then
begin
 -
 -
 -
end;
```

```
if a=1 then gosub 100
-
-
100 -
110-
120 return

OR
if a=1 then -:-:-
```

The second option is cetainly quicker unless one of the commands is itself an if in which case the only option is the first one.
A few miscellaneous points:

```
if keypressed then -
key:=getkey;
write ('hello');
read (g);
{end of loop}
```

```
if inkey$<>"" then -
let k$=inkey$
print "hello"
input g$
rem end of loop
```

Note that key and g in the program are strings (char variables in the variable declarations section) and in BASIC should have a $ suffix.
The main program starts at BEGIN and ends with END. Make sure you run the program from this point. Remember to declare your arrays as in the variable declarations:

```
a:array [1..100,1..3] of real
```

```
dim a(100,3)
```

```
{**************IGNORE FOR SPECTRUM*************}
program threed;
uses crt,graph;
var
ax,ay,az,bx,by,bz,cx,cy,cz,co,so,o,o0,p0x,p0y,p0z,dpx,dpy,dpz,u,r,s,det,
sx,sy,osx,osy:real;
alx,aly,alz,blx,bly,blz,clx,cly,clz,det0:real;
{except for array declarations}
a:array[1..100,1..3] of real;b:array[1..3,1..3] of real;
rl,tx,ty:real;
mxx,mxy,u0,c,n,m,t,graphdriver,graphmode:integer;
key,g:char;
{*****************************************}

procedure dome;
begin
 a[t,1]:=sx;a[t,2]:=sy;a[t,3]:=sqrt(50-(sx-5)*(sx-5)-(sy-5)*(sy-5));
end;

procedure plane;
begin
 a[t,1]:=sx;a[t,2]:=sy;a[t,3]:=sy;
end;

procedure cone;
```

```
begin
 a[t,1]:=sx;a[t,2]:=sy;a[t,3]:=10-sqrt((sx-5)*(sx-5)+(sy-5)*(sy-5));
end;

procedure sine;
begin
 a[t,1]:=sx;a[t,2]:=sy;a[t,3]:=sin(2*pi*a[t,1]/10);
end;

procedure choose;
begin
if g='d' then dome;
if g='p' then plane;
if g='c' then cone;
if g='s' then sine;
end;

procedure genpoint;
begin
p0x:=5;p0y:=5;p0z:=12;
ax:=0;ay:=0;az:=1;
bx:=1;by:=0;bz:=0;
cx:=0;cy:=1;cz:=0;
t:=1;sy:=0;

repeat
  sx:=0;
  repeat
    choose;
    sx:=sx+1;t:=t+1;
  until sx=10;
  sy:=sy+1;
until sy=10;
end;

procedure rotate;
begin
alx:=co*ax+so*bx;
aly:=co*ay+so*by;
alz:=co*az+so*bz;
blx:=co*bx-so*ax;
bly:=co*by-so*ay;
blz:=co*bz-so*az;
ax:=alx;
ay:=aly;
az:=alz;
bx:=blx;
by:=bly;
bz:=blz;
end;

procedure axis;
begin
blx:=co*bx+so*cx;
bly:=co*by+so*cy;
```

```
 b1z:=co*bz+so*cz;
 c1x:=co*cx-so*bx;
 c1y:=co*cy-so*by;
 c1z:=co*cz-so*bz;
 bx:=b1x;
 by:=b1y;
 bz:=b1z;
 cx:=c1x;
 cy:=c1y;
 cz:=c1z;
  end;

procedure dot;
begin
if n=1 then s:=ax*dpx+ay*dpy+az*dpz;
if n=2 then s:=bx*dpx+by*dpy+bz*dpz ;
if n=3 then s:=cx*dpx+cy*dpy+cz*dpz  ;
end;

procedure plotpoint;
begin
cls;
for m:=1 to 100 do
begin
 dpx:=a[m,1]-p0x;
 dpy:=a[m,2]-p0y ;
 dpz:=a[m,3]-p0z  ;
 n:=1      ;
 dot;
 if s>0 then
  begin
  u:=s;
  n:=2   ;
  dot;
  r:=s;
  n:=3        ;
  dot;
  sx:=(u0/u*s+mxx div 2)   ;
  sy:=(u0/u*r+mxy div 2)    ;
   if (sx>0) and (sx<mxX) and (sy>0) and (sy<mxy) then
   plot (int(sx),int(sy));
 end;{if s>0}
end;{loop}
end;{proc}

Procedure angle;
begin
plot 0,0:draw 30,0
plot 0,0: draw int(30*cos(o0)),int(30*sin(o0));
end;


BEGIN
write('what shape?(D)ome,(P)lane,(C)one? or (S)ine');
```

```
read(g);
mxx:=255;mxy:=175;
u0:=100;
o0:=pi/4;
genpoint;
plotpoint;
for c:=1 to 2 do
begin
angle;
if keypressed then
begin
 o:=o0;
 key:=readkey;
 if (key='o') or (key='p') then
  begin
  if key='p' then o:=-o0;
  so:=sin(o);co:=cos(o);
  axis;
  plotpoint;
 end;
 if (key='q') or (key='a') then
  begin
  if key='q' then o:=-o0;
  so:=sin(o);co:=cos(o);
  rotate;
  plotpoint;
 end;
 if key=' ' then {space pressed}
  begin
  p0x:=p0x+ax;
  p0y:=p0y+ay;
  p0z:=p0z+az;
  plotpoint;
 end;
 if (key='Q') and (o0<pi-pi/20) then
   begin
   o0:=o0+pi/20;angle;
 end;
 if (key='A') and (o0>pi/20) then
   begin
   o0:=o0-pi/20;angle
 end;
end; {keypressed}
c:=1;
end; {infinite loop}
END.
```

I've taken pity on you and have substituted **plot** and **draw** for **putpixel** and **line** in pascal. Use q,a to rotate up down. o,p to rotate about your axis and space to go forward. As you can see, Pascal is much more structured than BASIC and I've only used some of its many cunning structures here. Pascal can also handle data not just in arrays but in trees and queues and stacks etc. so its very sophisticated.

Of course plotting points on screen is only the start. The next thing is to store them in pairs and then join them up to make lines. This obviously is even slower than the above and theres another problem. In the above program, a point is not drawn if its of screen (easy). But for

(You can also use shift + q and shift + a to increase/decrease the angle through which you rotate)

lines you really need to be able to draw only the portion of each line that is on screen (hard). The next stage is to have the points in groups of 3 and draw triangular surfaces between them. As well as clipping the resulting triangles to be on screen, you need to sort the triangles into distance order and print them from furthest away to nearest so that the nearest overlap the furthest and vice versa.

The maths of it all isn't much worse than what I've shown you but the clever bit is getting computers to be able to do it really quickly. For a start you could tabulate sin and cos values rather than getting the computer to calculate them each time.

I have a friend who has written a virtual reality program for his Archimedes. It allows you to fly around objects made of filled triangles with the shading of each determined by it position relative to a fixed light source and all in 50 frames a second!

Well I think that's enough concentrating for one month Code Crunchers, I suggest we all go and watch Tomorrow's World which requires no concentration at all. I think I've produced as much maths in this article as all the 'science' programs have put together **ever**. Stephen Hawking was told that every equation he put in his book would halve its sales so I've probably reduced the sales of SUK to 1 (me). The most science coverage we get is:

'Einstein's feery of wela'ivity vats where time seems to slow down when you've got yer wela'ives raaaaaand!' Laugh:I thought I'd never start.

I once saw a program about engineering students with subtitles for the deaf and a lecturer said: 'They [the students] can out-integrate anyone but they don't have any experience yet'. The subtitle writer clearly ignorant of the maths of integration translated this as:

'They can *help* integrate anyone...' It was the only meaning he could understand of the word. Who do you think of when I mention Maxwell, probably not James Clerk Maxwell who theoretically predicted the existence of radio waves and condensed the theory of Optics and electricity and magnetism into the **same theory.**

There are lots of so called science programs on television. Not one of them actually *is* a science program, they're all **medical** programs. This gives the arts graduates who produce them a chance to ignore science altogether and concentrate on ethics: genetic engineering:write or wrong. A few years ago: Nuclear weapons: write or wrong. Not: how do they work, ohhh no, no ideady not!

DIED ~~did~~ The only maths on TV is Carol Vordermann doing mental arithmetic. I thought that this as a marketable skill when Clive Sinclair invented the calculator. What next, a competition to see who can draw the best straight line without using a ruler?

I'd like to take these arts graduates, PR and advertising executives, personnel managers, psychiatrists, management theorists, astrologers and other professional sycophants and liars back to hell were they belong. I think I will!

ONCE MORE INTO THE BREACH DEAR FRIENDS! THERE IS A TIDE IN THE AFFARIS OF MEN WHICH TAKEN AT THE FLOOD LEADS ON TO VICTORY!

GERONIMO - TALLY HOOOOOOOO

[And now the one o'clock news. A man in a colourful suit and cape entered the offices of PR/astrology/yogic flying for business success inc. and demanded all the staff 'return to hell'. The man was promptly arrested for a breach of the peace and is remanded in custody pending a court hearing on Wednesday. The pound rose today despite speculation.....]

NEWS FROM THE WORLD OF SPECCI

Hello Folks,

let's see what I can tell you new in the Spectrum World. A few weeks ago, I was in Czech Repuplik and saw many interesting things!

DEMOS:
There were few demos new to me from Omegasoftware. Mostly with much Sounds. But also I saw MQM 6. This Megademo is really amazing, with ABBA-sampling and Morphing-Part. But the greatest thing I saw was a preview for MQM 5: 11 Parts from Matasoft, 4 Parts from Omega and much more...all in all about 30 Parts or more. Due to the length of this demo, it is not finished at all. But it will soon appear.

UTILITIES:
I saw some nice packers which are even better than the old TURBO-IMPLODER. Also I saw many nice disc utilities for MB 02 and a great DTP-Pack (not that PCG's one).

MB 02:
Unfortunately production is still not finished. But I saw the Prototype and it is really great. MB 02 can not only format up to 2 MB and is faster than any other interface, it makes also from your 128k Specci a 256k Specci and turns your 3,5 MHz to about 18 MHz (if you use MB 02's possibilities). It is even better than I ever thought. MB 02 will hit the street in May and it will cost about 130 Pounds (available from SINTECH).

Some news also from Germany. Now you can buy the SQ-Tracker complete with instructions from SINTECH. SQ-Tracker is much better than Sound Tracker and with the instructions it is easy to handle for everyone. Price:
16,00 Pounds

Also SINTECH got a new special software offer:

DIZZY's EXCELLENT ADVENTURES	3,00 Pounds
SUPER ALL STARS	3,00 Pounds
SUPERSTAR SEYMOUR	3,00 Pounds
TRAZ	1,80 Pounds
TRANSMUTER	1,80 Pounds
VIZ - the game	1,80 Pounds
CAPTAIN PLANET +3 Disc	4,50 Pounds
HERO QUEST DOUBLE PACK +3 Disc	6,80 Pounds
NORTH & SOUTH +3 Disc	4,50 Pounds
ROCK STAR ATE MY HAMSTER +3 Disc	2,00 Pounds
SIM CITY +3 Disc	4,50 Pounds
SOCCER SPECTACULAR +3 Disc	3,20 Pounds

But that's not all available from Sintech. Also there is a new sound interface which blasts your Spectrum with the same sound as AMIGA. Complete with Software only 30,00 Pounds

Please add 5,50 Pounds per order for postage and bank costs.
Orders should go to: SINTECH, Gastäckerstr. 23, 70794 Filderstadt.

Well, that's all for this time. I hope you liked this column.

Bye

Thomas

Zinerman's Test

'HELLO ZINNERMAN HERE..ONCE AGAIN' REVIEWING MORE GAMES, DATING WAY BACK IN THE DAYS OF HAPPINESS AND WEALTH.

Another simulation you may well ask, but this issue good old DARTS! budget priced game by:

MASTERTRONIC
ADDED . DIMENSION
or just simply 'MAD'

SOME THINGS YOU HAVE HAD SOME THINGS YOU WISHED YOU HAD AND SOME THINGS YOU ARE GLAD YOU NEVER HAD!!

of games. around the year of 1986

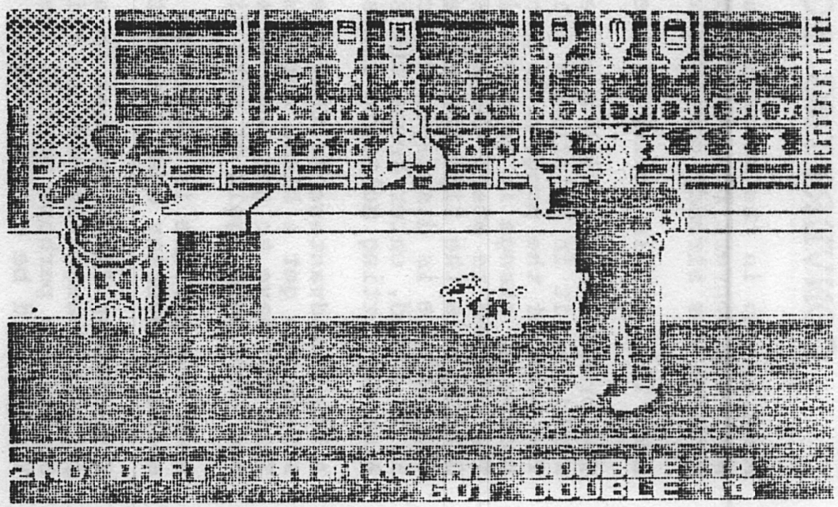
What an excellent excuse to venture out every night to the local pub by telling your loved one that you are now in the local darts team.

But that was the days before '180' came along from MASTERTRONICS

and your loved one could keep you indoors every night so that you could both play darts without going to the local.....good . old MASTERTRONIC eh?

THE GAME

180 has eight different opponents to challenge you in winning at darts. A two player



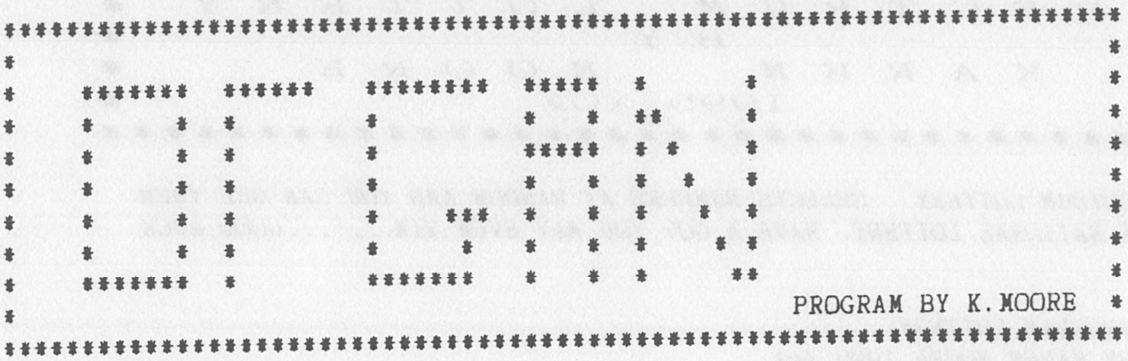
'180' from:-
MASTERTRONICS was one of the successful budget software houses, which evolved from the joke to the serious by introducing their MAD range

```
**************************************
*  S P E C T R U M     L O T T E R Y  *
*                B Y                 *
*        K A R E N     M O O R E     *
*                1995 (C)            *
**************************************
```

THE SPECTRUM LOTTERY SELECTS NUMBERS AT RANDOM AND YOU CAN USE THEM FOR THE NATIONAL LOTTERY. HAVE A GO? YOU MAY EVEN WIN.....GOOD LUCK

```
1 REM PROGRAM LOTTERY
2 REM BY KAREN MOORE 1995 (c)
10 BORDER 2:INK 4: PAPER 6
11 PRINT : PRINT
20 PRINT "        Here are six randomly selected numbers":PRINT ""
30 PRINT"         for you to enter the  National Lottery."
31 PRINT:PRINT AT 9,8;"NATIONAL LOTTERY"
33 PRINT
34 PRINT: PRINT
35 PRINT AT 12,7;"    GOOD LUCK!"
40 PRINT AT 15,5;"PROGRAM BY KAREN MOORE   1995 "
50 PRINT
55 PRINT AT 17,5;"SPECTRUM COLLECTOR
                  A BIG FAN OF SPECTRUM UK"
60 PAUSE 400:CLS
69 RANDOMIZE
70 FOR I=1 TO 6
75 LET NUM=INT (49*RND)+1:LET MATCH=0
80 FOR J=0 TO I-1
90 IF NUM=J THEN LET MATCH = 1
100 NEXT I:NEXT J
110 IF MATCH= 1 THEN GOTO 75
120 PRINT TAB (I*5+5);NUM,
130 NEXT I
140 PRINT "":INPUT "PLEASE ENTER YOUR NUMBERS 1-6
                    PRESS KEY LETTERS (E)ENTER/(S)STOP)";A$
145 PRINT "THESE ARE YOUR NUMBERS .THEN PRESS (S) STOP !! GOOD LUCK "
150 IF A$="E" THEN GOTO 70
160 IF A$="S" THEN PRINT "THANK YOU FOR YOUR NUMBERS"
170 PAUSE 400:CLS
180 INPUT "ANOTHER SELECTION?    (Y/N)";A$
190 PRINT
200 IF A$="Y" THEN GOTO 140
210 IF A$="N" THEN STOP
```

END OF LISTING



Let the Spectrum play the Organ like the real thing with Spectrum Keys.

First type in the listing: ORGAN PROGRAM BY Karen Moore (C) 1995

```
10   REM ORGAN
100  REM Play the Spectrum
110  DIM p(25)
115  REM set up pitch table
120  FOR n=1 TO 25
130 READ p(n)
140 NEXT n
150 DATA 0,64,64,4,3,5,7,9,64,11,12,14,64
160 DATA 64,13,64,64,64,2,6,10,64,1,64,8
170 GO SUB 500
175 REM Note playing loop
180 LET a$=INKEY$: IF a$="" THEN GO TO 180
190 BEEP .25,p(CODE a$-96): GO TO 180
200 STOP
490 REM Display drawing subroutine
500 LET b$=" "+CHR$ 133+CHR$ 138
510 FOR r=1 TO 4
520 PRINT AT 3+r,3;b$;
530 FOR k=1 TO 7
540 If k=2 OR k=6 THEN PRINT "  ";:NEXT k
550 PRINT b$;: NEXT k
560 NEXT r
570 PRINT AT 2,4;"w e    t y u     o";
580 PRINT AT 13,3;" a s d f g h j k l "
590 FOR k=0 TO 8
600 PLOT 16+k*24,80
610 DRAW 24,0
620 DRAW 0,64
630 DRAW -24,0
640 DRAW 0,-64
650 NEXT k
660 PRINT AT 17,1;"PLAY NOW";
670 RETURN
```

Have fun, you can play like a real thing "ORGAN" bye for now.

MODE TIPS

By Miles Kinloch

Forcing the Spectrum into 48K mode, without stopping a program.

If a +D or Disciple is attached, there is an easy way to do this. The trick is to use the SPECTRUM command along with the Disciple/+D POKE 23728 error-trap facility - this prevents the SPECTRUM command from stopping the program, so it just carries on running in 48K. For example:-

```
10 POKE 23728,1
20 SPECTRUM
30 RANDOMIZE USR 8
40 POKE 23728,0
50 PRINT "You are now in 48K"
60 REM Rest of program
```

If you added this to the loaders of 48K-only programs, it would then allow everything (with the exception of ones that need USR 0 mode) to be loaded initially from 128K. This could be very useful if you use a 'menu loader' with perhaps a mixture of 48K and 128K items on the same disk. The reason for the RANDOMIZE USR 8 command, by the way, is to sort out any stack corruption that can sometimes occur after POKE 23728 is used (see my '+D Secrets' article).

Now, you may be thinking, this is all very well if you're in 128K when you run this, but what if you were already in 48K mode, where the SPECTRUM command doesn't exist? This isn't a problem, however. On line 20 you'd have the UDG 'T' instead, which would normally produce a 'Nonsense in BASIC' error, but because 23728 is POKEd, this error is masked, so it just passes over it as if nothing had happened.

Detecting which mode the Spectrum is in.

There are various techniques for doing this, but one of the simplest and most failsafe must surely be to test the contents of system variable 23669: if this holds 26, you're in 48K; if it doesn't, you're in 128K - and that's all there is to it. (Ironically, the Speccy manual says this system variable is "very unlikely to be useful"!)

Try this, and see for yourself:-

```
10 IF PEEK 23669=26 THEN PRINT "You are in 48K mode": STOP
20 PRINT "You are in 128K mode": STOP
```

Miles Kinloch

Sinclair Review

Welcome once again to Sinclair Review. Last time I looked at the ZX80 (a class computer). This month we were going to check out the ZX81.

There are some huge changes between the two. The first thing you notice is the case. Yes, I do know its black, but thats not what I was going to point out. Its how well made it is. The ZX80 looks a bit cheap. Its so thin, I keep thinking that its going to fall apart. But the ZX81 is very well built. The only fault that I can find is that it has kept the crummy old keyboard.

The computer it-self is smaller and neater than the ZX80. It only has 4 chips (ROM, RAM, CPU & BASIC). This only goes to show how much Clive and his team progressed in only one year of development.

At the back of the ZX81 is an edge conecter that can be used to add such things as Graphics ROMs, sound interfaces, the ZX printer and of course, RAM. There was alot of money made from such upgrades until 1986, when computers had anough memory. Now again its a booming market as PC's need so much due to gready applications. (don't know why!)

Upto 64k of RAM could be stacked up. The ZX 16k RAM pack was the Sinclair one, but had a bad wobble problom. The no thrils RAM pack cost £29.95. That wasn't bad, but remember, it had no case.

How much was the computer when it was new? well, in my book that I own, published in 1984, it suggest that it was a sum of £40! I don't know how rich or poor you are, but I don't think that it woul send us into the red. Whats £40 at todays values?

Another fact is that in 1984 a ZX81 came off the production line every 10 seconds!

Well, I think that every Speccy fan should have one of these conputers. I paid £4 for a boxed one a year ago. Keep your eyes open and get one!

Richard Coles.

****
*
* COLIN'S
* CAPERS.
*
* BY COLIN BIBBY *
****

FITTING A TAPE COUNTER

Fitting a tape counter to the +2 might be a little messy and difficult for some to consider although really it is a relatively simple task i think. fitted on to the tape loading door mine concentrates on lightly engaging with the trailing or left spool driver. since not all tape counters will be identical, specifications will differ so very briefly.

My counter is fitted on top of the cassette loading door with it's pulley wheel slightly protruding through the 3/8" hole drilled which had been previously centrally marked. (NOTE:- the clear plastic used for these cassette doors is a particularly cheap and nasty hard type to drill without it shattering so take great care to strengthen both upper and lower surfaces with good strong adhesive tape before drilling), or find another sucker to risk it for you, don't ask me though.

Three screw fixing holes and 1/4" standoffs were also necessary for my counter, i was lucky to have some short plastic tube to suit the standoffs (spacers)but would otherwise probably have made them from ball pen or similar tubing. on final completion and re-assembly the friction pad was trimmed from soft self adhesive draught excluder rubber then stuck to the lower surface of the pulley wheel. Hey presto, its brill and doesn't foul the cassette when inserting. i will leave it to you to work out the rest. Note:- only very light contact with the left spring loaded spool driver is practical therefore the constructor needs to find a good condition drag and friction free counter unit.

I had further intended to part customise my +2 by fitting a small hollow yellow plastic duck over the counter. but after arriving home with the said duck it was too small, so instead i boxed the counter in with silver backed card. a very small sample of each is available to all who need them FREE for 2nd or 1st class (your choice) sae to: C, BIBBY, 2 MOORCROFT ROAD, NORTHERN MOOR, WYTHENSHAWE, MANCHESTER, M23-0WJ. you get sufficient foam rubber and silver backed card for the project.

To further compliment speeding up tape load times i made some tiny labels. these are so arranged for sticking on tape cassettes and approximately fit in with tape counter readings. i simply fast forward the relevant tape to counter position 50 then stick

one of these little labels as close as possible to it's indicator mark 50, then the 100 / 150 etc marks and they correspond rather well.

Futhermore, dubbing the tape with a brief microphone message between progs is essential for me. HEY BILL what about a microphone socket for the +2?.

TAPE HEAD CLEANER DE-MAGNETISER

The tape head cleaner mentioned on p21 at £7, my local tandy was out of stock of these last week but informed me they would be in this week at £9;99p. the following day i was searching for modem plugs at maplin M/cr and asked about the relevance of these de-magnetisers for my stereo, i was satisfied that it seemed practical to purchase one, so i bought one of theirs for £1;99p, i don't know how we valuate these de-magnetiser tape cleaners but i do know that maplin aren't in the business of knowingly supplying sub-standard goods.

MODEM PLUGS AND THOUGHT PROVOKING IDEAS

Modem plugs sought such as those fitted to the spectrum light gun, fun is the name of the game and games aint my style, having said all that i feel sure that many spectrum fans will by now own more than one of these fab computers and are always keen to find out more about all this techno.

TXD and RXD from one zx to another might be an area of extreme interest to many but i have heard little about the related INs and OUTs.

My antique apricot computer had an expansion panel inserted into one of it's expansion sockets which turned out to be a modem extra for TXD etc, this panel now unused i removed it for safe shelf storage, however, mounted on this modem panel is a socket identical to those on the rear of the spectrum for light gun interface etc, the speccy light gun plug is a perfect fit which explains my querying those at maplins only last week, maplin however do not stock them.

To transmit data from the TXD of speccy a/ then receive same data at RXD of speccy b/ seems an added fun area, but is it of any practical use ? plus, is it easy or a too complicated procedure ?.

Next is it possible to link two +2s so that they then become a 256K speccy ? again, is it of any practical use.

And lastly if TXD and RXD via two +2s is practical, then can we link them via the telephone networks thereby reducing an otherwise expensive conversation to a shorter data chat using IG / Tasword or whatever ? fun areas for sure.

BACK IN TIME...

WITH ARNOLD YATES

I THOUGHT FOR THIS ISSUE OF BACK IN TIME WE COULD TAKE A LOOK AT SOME OF THE MANY HARDWARE GADGETS THAT WERE AVAILABLE IN THE HECTIC SPECTRUM DAYS OF 1985...WELL APPROX 1985.

LETS START WITH THE RAM TURBO INTERFACE, WHEN RELEASED IN JANUARY 1985 IT COST £22.95p, THE RAM TURBO HAD A THROUGH PORT, AND YOU COULD LOAD THE ROM GAMES CARTRIDGES THAT WERE THEN JUST BECOMING AVAILABLE, GAMES SUCH AS, SPACE INVADERS, PLANETOIDS ETC, THE BENEFITS OF THE RAM TURBO AND ROM GAMES CARTRIDGES WAS THAT YOU HAD INSTANT LOADING, IE (NO MORE HANGING AROUND GROWING A BEARD).

THE RAM TURBO ALSO INCORPORATED TWO 9 WAY D PLUGS FOR STANDARD JOYSTICKS, WHICH WERE COMPATIBLE WITH THE KEMPSTON AND PROTEK PROTOCOL JOYSTICKS, AND ALSO WORKS WITH THE LATEST QUICKSHOT MK11 AUTO AND RAPID FIRE JOYSTICKS, ANOTHER UNIQUE FEATURE OF THE RAM TURBO WAS THAT IT HAD A BUILT IN SAFETY DEVICE, RAM TURBOS CAN STILL BE FOUND BUT ALAS ARE FAST BECOMING COLLECTORS ITEMS AS INDEED ARE THE ROM CARTRIDGES.

AROUND ABOUT THE SAME TIME OF THE RELEASE OF THE RAM TURBO ANOTHER SPECTRUM GADGET HIT THE SCENE, THIS ITEM WAS CALLED THE R.A.T WHICH STOOD FOR REMOTE ACTION TRANSMITTER IE, (A CORDLESS JOYSTICK), THIS WAS MADE BY CHEETAH, R.A.T WAS AN INFRA RED TRANSMITTER CONTROLLER, THERE WERE NO TRAILING LEADS ALL YOU DID WAS JUST SIT BACK IN YOUR CHAIR UP TO 30 FEET AWAY AND USE ITS TOUCH CONTROL, NO MOVING PARTS, IT WAS EXTREMELY FAST TO USE, HAD A LONG LIFE, AND NO EXTRA SOFTWARE WAS NEEDED.

HOW THE R.A.T WORKED WAS THAT IT HAD A RECEIVER INTERFACE UNIT THAT PLUGGED INTO THE REAR OF YOUR SPECTRUM, AND ALL YOU DID TO OPERATE IT WAS JUST POINT THE CONTROLLER AT THE INTERFACE AND AWAY YOU WENT, I MUST SAY THAT I HAVENT SEEN ONE FOR SALE NOW FOR QUITE A LONG TIME, SO ONCE AGAIN IT LOOKS LIKE ONE FOR THE COLLECTOR.

MY PERSONAL OPINION OF THE R.A.T IS THAT IT WAS A VERY SLIICK AND NEAT DEVICE, BUT I AM ONE FROM THE OLD SCHOOL WHO MUCH PREFER THE RUGGED JOYSTICK.

BACK IN TIME...

WITH ARNOLD YATES

BY FAR THE BEST JOYSTICK IN MY OPINION HAS TO BE THE KONIX SPEEDKING, THIS IS HELD IN THE LEFT HAND THE FIRE BUTTON IS CONTROLLED WITH THE FIRST FINGER OF THAT HAND, AND THE JOYSTICK CAN BE MOVED AROUND WITH THE RIGHT HAND.

THE KONIX SPEEDKING HAS A VERY QUICK RESPONSE TO THE UP, DOWN, LEFT, RIGHT, A REALLY STURDY JOYSTICK INDEED, IT COST AROUND £12 WHEN NEW, BUT I PICKED MINE UP FOR £2.50P, NOW THAT IS WHAT I CALL A REAL BARGAIN, I DON'T USE AN INTERFACE WITH THIS STICK AS I HAVE A CONNECTOR THAT FITS ON TO THE JOYSTICK POSITION NO.1 ON THE 128K SPECTRUM AND THE OTHER END FITS ON THE D PLUG OF THE JOYSTICK, THUS DOING AWAY WITH THE NEED FOR AN INTERFACE.

ANOTHER SPECTRUM HARDWARE ITEM TO COME TO LIGHT IN 1985 WAS THE TTX 2000 TELETEX ADAPTOR, THIS FITTED UNDER YOUR 48K SPECTRUM, NO MODIFICATION TO THE SPECTRUM WAS NEEDED, ONCE FITTED UNDER YOUR SPECTRUM THE UNIT IS CONNECTED WITH A 56 WAY CABLE TO THE EXPANSION PORT, AND CAME WITH AN AUXILIARY POWER SUPPLY TO PLUG THE TTX 2000 INTO THE MAINS.

THE UNIT WILL WORK WITH ANY STANDARD BLACK AND WHITE OR COLOUR TV, DISPLAYING 40 COLUMNS OF GRAPHICS ETC, X 24 ROWS IE FULL TELETEXT PAGE REPRODUCTION, THERE ARE FOUR CHANNEL PRESET CONTROLS ON THE UNIT, AND PAGES ARE CALLED UP BY SIMPLY KEYING IN THE APPROPRIATE NUMBER.

THE USUAL TELETEXT OPTIONS SUCH AS HOLD, REVEAL ARE PROVIDED FOR, AND TELETEXT PAGES CAN BE HELD ON SCREEN, STORED ON MICRODRIVE FOR LATER RECALL, OR PRINTED OUT FOR A PERMANENT RECORD, I HAVE SEEN THE TTX 2000 TELETEXT BUT HAVE NEVER HAD THE OPPORTUNITY TO USE ONE.

AT THE TIME OF MANUFACTURE THE UNIT COST A STAGGERING £145, ALAS THEY ARE NO LONGER IN PRODUCTION, SO ONCE AGAIN IF YOU WANT ONE ITS A CASE OF BOOTSALES, SPECTRUM RALLYS, OR PLACE AN AD, BUT BE WARNED THEY ARE A VERY SCARCE ITEM INDEED.

WELL I HOPE THAT OUR LOOK BACK IN TIME HAS BEEN OF INTEREST TO YOU AND I LOOK FORWARD TO SEEING YOU ALL AGAIN IN THE NEXT ISSUE SO UNTIL THEN KEEP WELL AND HAPPY SPECCYING.

PLUS D PITFALLS (OR DOS DO'S AND DON'TS!)
By Miles Kinloch

With the relatively large number of DOS patches and +D resident utilities in existence, plus the different guidelines that apply to using them in conjunction with G+DOS and Betados, I felt some clarification of this subject was badly needed, and decided to write this article.

For Betados users, the most important point to realise is that this DOS uses the whole +D RAM, with none to spare. Therefore, the ONLY such items that can be used with it (apart from the bug fixing patches) are SQUASH and SNAP OUT, both of which are specifically designed to overwrite certain facilities in a non-haphazard, non-destructive way. (Both SQUASH and SNAP OUT can be present simultaneously, by the way, but install the former first.)

The situation with G+DOS 2a is somewhat different, since with the standard, unmodified version, there is approximately 2K of spare +D RAM, which can conveniently be exploited for a variety of purposes. Few of the utilities and patches which do so, however, actually use the entire 2K, especially some of the smaller ones such as the snapshot/key '0' interrupt patch, OPEN-3-OUT, ATTR +D etc., which take only a few dozen bytes each. The difficulty arises if you want to install more than one at the same time - which combinations can safely be used together, and which ones would conflict in terms of memory requirements ? The problem stems, of course, from the fact they were all written by different people at different times, and as a result, there is no organised, mutually exclusive allocation of space to each item.

If anyone is interested, I have compiled a compatibility table, listing all the patches and +D resident utilities I know of, cross-referenced to show which combinations are feasible, and which ones aren't. I also managed to adapt some of the patches to work together, where they wouldn't in their original form, so it's important to realise that thre entries for them in this table refer to these special versions only. If anyone wants a copy of it, they are welcome to write to me. (Please note, by the way, I am unable to give any help with UNIDOS, as I don't have it.)

In conclusion, my general advice would be, if you just want to keep things simple and avoid confusion, it's probably better to stick to the safe rule of only ever using one DOS-resident item at a time. Provided you re-boot before installing another, you then can't possibly go wrong!

The other area I want to touch on, concerns DOS configuration and debugging. First of all, could I ask people to check that their G+DOS 2a 'CONFIG' program is version no. 2.3, dated Feb. 1989. The reason I mention this, is that there seems to be at least one other version in circulation, which was apparently released in error to a few people at one stage, and contains some bugs. (These were later fixed in V2.3).

Could I also ask people to make sure they are using the latest versions of my DOS bug-fixers - the final versions are the ones I supplied to Spectrum U.K., so if you got them from Roy and Julie, you'll be OK. However, I did make earlier versions before all the DOS bugs finally came to light, so if anyone's not sure, there's an easy way to tell - enter LOAD d1 - if this gives an 'OK' report, you're using the current ones, but if you get a 'Nonsense in G+DOS' error, you must be using an earlier version. This leads meto another important point - if anyone finds they do need to update, please start from scratch, using the Beta Dos Maker program again. DON'T try to take a short-cut by running the new fixer on your present, partially-fixed DOS - it can't be done that way!

Some advice now about the procedure for making the Betados system file. Although it doesn't mention this in the manual, it is vitally important to realise that when you run the BDM program and are asked to insert a disk containing a normal G+DOS system file, the "+SYS 2a" file you use for this purpose MUST BE COMPLETELY UNMODIFIED. Under no circumstances should you use one that contains any patches etc., including the G+DOS bug-fix amendments - it has to be in exactly the same form as when you saved it with the CONFIG program.

The DOS bug-fixers, including SNAPFIX, are completely safe with almost all DOS-resident patches and utilities, since they work by overwriting some redundant code, rather than using the spare 2K at the end. The only exception, in fact, is THINGI, which also makes use of this little-known area of redundant code, so never install the latter into anything but an unmodified G+DOS.

Finally, a word of caution for users of Betados: there are many programs which, although perfectly safe once the DOS bugs have been cured, can cause nasty effects if used with an 'unfixed' Betados. Do please make sure, therefore, your DOS is debugged before using any of the following :- DISC-KIT, +D CONVERTED TASWORD 128 (AND +2), HACKER'S WORKBENCH, PROFILE, +D CONVERTED ART STUDIO, BETTERBYTES' SOFTWARE. There could well be more to add to this list - these are just the ones I know about!

Miles Kinloch,
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Edinburgh.
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WRITEBACK

MAY FROM BLACKPOOL WRITES:
HELLO JULIE & ROY THANK YOU FOR THE GREAT APRIL ISSUE OF SPECTRUM UK ONCE AGAIN IT IS AN EXCELLENT READ, I WAS SORRY TO HEAR OF THE SAD DEMISE OF OLD BESSIE, IT MUST BE DIFFICULT GETTING USED TO USING ANOTHER MACHINE, ANYWAY WHAT I AM TRYING TO SAY IS, I DON'T CARE WHAT MACHINE YOU USE BECAUSE SPECTRUM UK IS STILL THE BEST MAG EVER FOR US SPECCY LOVERS SO KEEP UP THE GOOD WORK AND ROLL ON THE JUNE ISSUE.

JULIE SAYS:
THANK YOU FOR YOUR LETTER MAY, IT IS NICE TO HEAR FROM YOU AGAIN, IT IS INDEED DIFFICULT GETTING USED TO ANOTHER MACHINE, BUT HOPEFULLY IN THIS ISSUE YOU WILL NOTICE THAT WE HAVE IMPROVED SLIGHTLY ON THE PAGES THAT WE HAD TO PRINT IN A HURRY TO GET THE APRIL ISSUE OUT, SOME OF THOSE WERE TERRIBLE, STILL MAY ONWARDS WE GO FOREVER ONWARDS.

PETER FROM CHESTER LE STREET WRITES:
HI GANG HOW ARE THINGS GOING I THOUGHT I WOULD DROP YOU A LINE TO OFFER MY SERVICES, I WORK IN PUBLISHING AND MUST SAY HOW VERY IMPRESSED I AM AT THE RESULTS THAT YOU HAVE MANAGED TO PUT TOGETHER SO FAR USING YOUR ANCIENT TELEX, WELL NOW IT IS TIME FOR YOU BOTH TO BE HELPED.

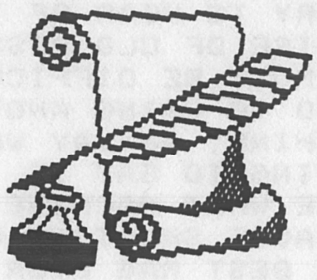
YOU EXPLAINED IN YOUR LAST LETTER TO ME THE SET UP THAT YOU ARE NOW USING, SO FIRST FIND ENCLOSED SOME PAGE LAYOUTS THAT YOU WILL FIND INVALUABLE IN THE FUTURE, AND ALSO IN THE NEAR FUTURE YOU WILL RECEIVE A HEAP OF VERY USEFUL PROGS TO AID DESIGN.

REMEMBER WHATEVER PROBLEMS YOU ENCOUNTER OF A PUBLISHING NATURE THEN JUST DROP ME A LINE AND I WILL HELP YOU ALL I CAN.
REGARDS PETER.

continued on next page

WRITEBACK

JULIE SAYS;
WE ARE VERY GRATEFUL INDEED FOR YOUR HELP PETER, AND CANNOT THANK YOU ENOUGH FOR THE PAGE LAYOUTS AND THE DISCS OF PROGRAMS THAT WE HAVE JUST RECEIVED IN THE POST THEY REALLY ARE EXCELLENT,IT IS TOO LATE TO PUT THEM TO GOOD USE IN THIS ISSUE OF SPEC UK BUT WE MOST CERTAINLY WILL BE DOING SO FROM THE NEXT ISSUE ONWARDS.



SO ONCE AGAIN LET ME THANK YOU FOR TAKING THE TIME AND TROUBLE TO HELP US TO BETTER THE QUALITY OF THE MAGAZINE FOR THE GROUP.

JAMIE FROM LEEDS WRITES;
I WONDER IF YOU CAN HELP SHED SOME LIGHT ON A PROBLEM I AM HAVING CONCERNING THE COMPANY SOFT OPTIONS...? HAVE THEY CHANGED ADDRESS OR GONE BUST OR WHAT, AND CAN YOU TELL ME IF ANY OTHER MEMBERS ARE HAVING PROBLEMS CONCERNING THEM, IF SO I WOULD BE VERY INTERESTED TO HEAR ABOUT IT.

JULIE SAYS;
THANK YOU IN BRINGING SOFT OPTIONS TO OUR NOTICE JAMIE, JUST RECENTLY WE HAVE HAD TWO OTHER MEMBERS WRITE IN EXPRESSING CONCERN, AT THE MOMENT WE ARE TRYING TO CONTACT THEM TO FIND OUT WHAT IS HAPPENING.

INITIALLY QUITE A FEW MEMBERS WROTE IN HIGHLY RECOMMENDING THAT WE CARRY A SOFT OPTION AD FOR THE BENEFIT OF OTHER MEMBERS, WHICH WE WERE PLEASED TO DO, BUT OBVIOUSLY WE SHALL WITHDRAW IT UNTIL WE KNOW EXACTLY WHAT IS GOING ON, AND CAN WE ASK ANY MEMBERS WHO MIGHT KNOW SOMETHING TO PLEASE LET US KNOW.

ALSO WE ARE WITHDRAWING OMNIDALE LTDS AD, THE REASON BEING THAT MEMBERS HAVE BEEN WRITING IN COMPLAINING THAT THEY WERE WAITING WEEKS TO GET THEIR SPECCYS BACK FROM BEING REPAIRED, NOT GOOD ENOUGH WHEN OMNIDALES AD CLEARLY STATES IE (WITH A VERY QUICK TURNAROUND).

QUESTER'S QUORUM.

Firstly let me express my gratitude to all those members who have written in support of this section of the magazine. It was very gratifying to receive your letters and solutions to games. Since I still have this dream of making the Spectrum a major adventure playing platform again, I have been seriously considering the future requirements needed to make this a reality. One aspect of our struggle has much in common with any fight to achieve an aim, namely the old axiom United We Stand Divided We Fall. This I feel is the crux of the whole problem in that we adventurers are by nature a solitary bunch. We seem to much prefer to attain mastery over our chosen Quest without interaction with others similarly involved. Unfortunately this results in any efforts to further the cause of Spectrum adventuring being sporadic at best and non existent at worst.

Another problem is that there are many people playing Spectrum adventures who are neither members of Spectrum UK, nor do they own a Spectrum. I am referring of course to those playing under emulation on another machine. Despite their decision to not actually own a Spectrum I believe they are still valid as Spectrum enthusiasts, and could well become actual owners if brought under the wing of Spectrum UK. Apart from which to a software publisher a Spectrum emulator game sold is still a great boost to profitability and therefore continued existence. I therefore believe that it is very important to contact and recruit everyone who uses a Spectrum software in whatever form.

I hope that you can see from the above that what is urgently required is that we all unite in pushing the Spectrum in every way conceivable. As a first step it will require interaction between all the existing membership to enable ideas and knowledge to be freely disseminated and available. I am but a lone wolf howling in night, together we form an unstoppable pack. Evolution taught the wolf that hunting as a pack brought much greater success, we must learn from the wolf's example.

It has therefore been decided that Spectrum UK should form it's own adventure club, membership of which is covered by your existing subscription to Spectrum UK, and is open to anyone playing Spectrum adventures in whatever form. Over the coming issues I wish to publish a list of all members joining the new club, thus enabling each to write to the other. I hope members will also supply a list of games they have solved and be prepared to offer advice to other members stuck in one of those games.

I also wish to periodically hand over the review spot to any members wishing to write a review of a new game when we receive them. This should give a more balanced view than just my own opinions. Similarly if you have something to say I will gladly turn over Quester's Quorum to you for one month. There is no need to worry about the quality of your english or spelling as I will edit each article before submitting it to Roy.

Over the coming months I shall be placing adverts in Micromart etc. to attract new members to the club. I hope that members will also take up the challenge and place adverts in their own locality. The advert should be something like :- DO YOU PLAY SPECTRUM ADVENTURE GAMES EITHER ON A SPECTRUM OR UNDER EMULATION?

IF SO YOU NEED THE NEW SPECTRUM ADVENTURER'S CLUB. HELP AND ADVICE ALWAYS FREELY AVAILABLE. SEND AN SAE TO 28, ROCKINGHAM DRIVE, MELTON MOWBRAY, LEICESTERSHIRE, LE13 OLQ. DO IT NOW!!!! Remember the aim is to attract new members to Spectrum UK not just the adventure club.

The first step is for you to send in your name and address so that you can be registered as a member. I would also like suggestions for a name for the club plus any ideas you may have for widening the adventure user base.

I of course realise that involvement in the way I have outlined may be time consuming, but I am certain that you will find it rewarding. I myself run a small contract cleaning business with the help of my wife. We are the only employees and carry out the cleaning every evening six days a week. Since we have no backup it means that we have not had a day off for ten years, nor any kind of holiday not even Bank Holidays. We even have to work Boxing Day as one of our clients is the local 12 man veterinary group who hold emergency services every day of the year. On top of that to make ends meet I work at the local Domestic Waste Collection Site at least two eleven hour days every week. I also take over there when the contractor has his holidays which next occurs on June 3rd. From that date I shall be working 17 hours a day for 15 days (Thanks Mr. Major & Co.). Usually this means that I sit up until 3 am writing my articles for the magazine.

I am not telling you this to prove what a wonderful person I am (my wife would soon put me right on that count), the point I am making is that if I and the others involved in producing this magazine (especially Julie & Roy whose workload is now immense with the success of Spectrum UK) can make the time then so can you. The one factor that drives us all is commitment to the Spectrum. Now is the time to turn your commitment into action by taking up the challenge and becoming involved. Together we can take Spectrum adventuring into the twenty first century, alone I can do nothing.

Lastly I have been asked by Barbara Gibb to inform members that Adventure Probe are now the sole suppliers of Larry Horsefield's games. Please do not send orders to FSF Adventures as it no longer exists. If you send an SAE to Barbara she will gladly send you a list of the games she is able to supply.

As ever please write to 101, Bury Road, Stowmarket, Suffolk, IP14 1PD.

QUESTER'S REVIEW.

As promised this month we look at Axe Of Kolt by Larry Horsefield, and supplied by Adventure Probe. On it's release this game received very high praise and now that I have been playing it for a while, it is very easy to understand why. The game consists of four parts each of which must be solved before you can tackle the next. Save your position at the completion of each part to load into the next.

You are Alric Blackmoon one time mercenary swordsman but penniless and footloose since the defeat of your last employer. A cold November day sees you entering the village of Hengemire in the kingdom of Hecate. A poor wander you do not realise that your fate is to search for a lost tomb and the magical Axe Of Kolt. For this weapon is the only hope Hecate has against the Xixon lizardmen.

If you are looking for value for money then this game certainly gives you that. Each part of this adventure is large and complex enough to be a game in it's own right. Nothing is as simple as it seems and examining everything and searching carefully will pay big rewards. Solving any game by Larry is no easy task and this one has problems with bells on (hint).

As the scenario implies you must first discover the nature of your quest, and having done so equip yourself for it. If you don't look out at an early stage you will come to a messy end. It is important to not only talk to other characters but also to listen carefully. Remembering everything you see and hear will certainly pay dividends. This game has a little of just about everything from bartering to boozing. Even a wolf in sheep's clothing. As with any of Larry's games a lot of lateral thinking and a bit of deviousness will be needed before you can complete it.

Not a game I feel for the complete novice as Larry is too experienced at creating truly devious games which are impossible to stop playing. Creating an addictive quality in a game is an art that only the truly gifted games creators ever really pull off. And Larry is certainly one of those. The Axe Of Kolt is in many ways perhaps the finest game he has ever written. Classically constructed with great use of text both descriptive and responsive. An absorbing game that makes a well worn theme into something much more. I think it would be impossible for any player not be drawn into wonderful quest that Larry has so artfully and lovingly created. If you haven't played the Axe Of Kolt yet then order it from Barbara Gibb now, if you don't you will regret it for ever more believe me. Adventure Probe, 52, Burford Road, Liverpool, L16 6AQ. A four part game of this quality for only £ has got be the best bargain for a long time.

A memory has just come to me which although hazy suggests that a prize was on offer to the first person to solve this game, when it first made it's appearance. I stand to be corrected but if memory serves me right it was won by an Ace games solver, destined for fame as our own 'Rochdale Balrog'.

SPREAD THE WORD